SCIENCES

Contractors and Engineers

magazine of modern construction

SEPTEMBER 1957

Prestressing warehouse roof slabs.
Page 44

PRESTRESSING

How to pave with ASPHALT

Kentucky highway's 11-inch Texaco Asphalt pavement includes insulation course, base and wearing surface

The heavy-duty Asphalt pavement designed by Kentucky engineers for 18 miles of US-62 is one of a number of designs effectively used for major highways throughout the country.

Kentucky covered the traffic-bound subbase with a 2-inch insulation course, consisting of Rapid-curing Cutback Asphalt and aggregate, mixed on the road by blade graders. This was followed by a 6-inch "black base" of coarse-graded, plant-mixed Texaco Asphaltic Concrete. To complete the pavement, a 3-inch surface of plant-mixed Texaco Asphaltic Concrete, using smaller aggregate than in the base, was laid in two courses.

Road-mixing Rapid-curing Cutback Asphalt and aggregate for 2-inch insulation course on traffic-bound subbase.

This 11-inch Texaco Asphalt pavement on a traffic-bound subbase is suitable for heavy inter-urban, municipal and airport traffic. Its cost is substantially lower than that of rigid paving with the same load-bearing capacity. Its resilience and freedom from joints insure maximum driving comfort for motorists, less wear and tear on vehicles. Its dark color eliminates glare, makes traffic lines stand out more sharply, causes snow and ice to melt faster.

Helpful information on methods and materials recommended for all types of Asphalt road and street construction, from heavy-duty paving to low-cost surface-treatment, is supplied in two Texaco booklets. Copies may be obtained without obligation from our nearest office.

Laying hot-mix Texaco Asphaltic Concrete on 18 miles of US Route 62 near Paducah, Ky.

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Contractors and Engineers

magazine of modern construction

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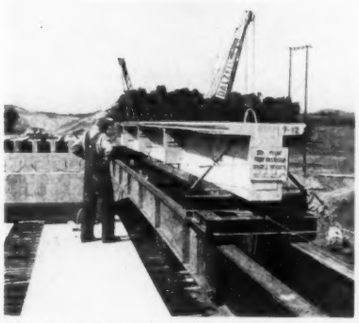

Placing prestressed member. Page 38

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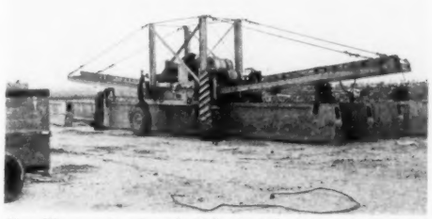


Handling pretensioned 40-foot girders. Page 62

Post-tensioning set-up. Page 72

editorial

From the construction boom—

Prestressed Concrete

A major portion of this issue is given over to the newest important material of the construction industry—prestressed concrete. Some of the factors that enabled prestressed concrete to catch on so in this country during the past few years are: shortages and rising prices of structural steel; assembly line advantages of prefabrication—particularly economy; durability and strength of construction; and the little maintenance required.

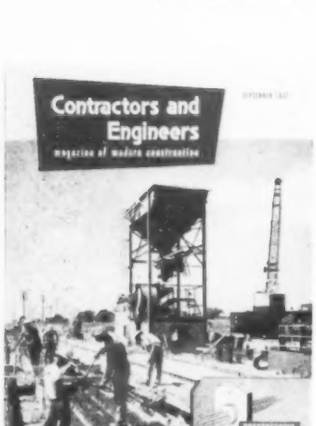
From the casting plants of some 220 fabricators come the products that have boomed the prestressed concrete industry into a $200 million-a-year business. In 1956, the volume of prestressed concrete turned out was double that of the 1955 production. In five years, experts in this new field predict, one-quarter of all concrete work will be prestressed.

The recent world conference on prestressed concrete (see page 29) was received and attended more enthusiastically than any convention or meeting within memory. Even the night sessions, at which films on prestressing were shown, were filled to capacity with interested conferees—students, professors, engineers, contractors, concrete products representatives, and prestress manufacturers. As shown on our contents page, this issue contains several staff-written, on-the-job, detailed reports of pretensioning and post-tensioning projects, along with the handling and erection phases of prestressed construction.

Various companies have hastened to get into what may appear to be a lucrative field. So far this year, more than 50 new firms have been added to the list of prestressed fabricators, a list which includes contractors, ready-mix concrete suppliers, aggregate producers, manufacturers of such precast-concrete products as blocks and pipe, and others in allied businesses. Prestressing is a field, however, that requires highly skilled and trained personnel, and it would be well for those planning to manufacture components to seek expert advice first.

For one thing, large capital reserves are necessary. The well educated and experienced designers and engineers needed in this work are in the upper bracket income group. Equipment and material costs for setting up a plant large enough to handle the potential market are high. Production facilities must be ample to meet delivery dates. Adequate storage space is required to stock the prestressed members until orders are filled. A steady supply of customers must be assured or the plant will be idle while the overhead costs continue. Most important of all, the product must be of the highest quality, for poor workmanship resulting in a structural failure would not only ruin the fabricator, but would also set back the entire prestressing process.

Taking their cue from the joint venture projects of several contractors, small or medium-size concerns are pooling their knowledge and resources to form organizations large enough to enter the prestressing business on a respectable scale. A detailed system of cost accounting gives a realistic picture of the firm's capacity and the direction it can take. Thus these fabricators can stand on a solid footing before they move ahead with this fast growing branch of the construction industry.



Crews set wire mesh atop and inside the channels of the double-T roof slab being prestressed for the 650,000-square-foot C.A.A. warehouse at Will Rogers Field, Oklahoma City. A Lima crane charges the Heltzel bins. The Construction Machinery Co. 2-yard mixer dumps to a shop-made bucket, carried by a dolly on rails, which delivers concrete to the forms. The daily production of the prestressing yard is about 5,000 square feet of roof slabs and 120 linear feet of beams daily. Page 44

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Feeder handles tough job of separating clay, gumbo from road stone material

A Ford truck dumps to the Universal Wobbler feeder, which does a scalping job to keep clay and gumbo from going to the Impact Master. Clean material is passed along; dirty material is stockpiled by the reversible reject conveyor coming up from under the Wobbler feeder.

Production of acceptable road stone material from coral and limestone mixed with clay and gumbo presents a problem. But Albany Limerock Corp., Albany, Ga., licked the problem and added this type of production to the asset side of its ledgers. Its crushing and screening setup worked so well that within a month, the firm was awarded a $1½ million contract to produce 150,000 tons of road stone material.

The firm's source of raw material between Albany and Dawson, Ga., consists of underground caves of coral and limestone bedded with clay and gumbo. A wagon drill powered by a Chicago Pneumatic compressor drills 18-foot holes in the limerock, and blasting is done with 40 per cent dynamite. A Caterpillar Traxcavator loads this material into Ford 6-yard dump trucks that haul to the complete closed-circuit scalping, crushing, and screening plant.

This consists of a Universal 36×45 Impact Master fed by a 9-inch pitch, 16-bar, 36-inch-wide Universal Wobbler feeder. Both crusher and feeder are mounted on a steel truck frame with three axles for portability.

The natural material contains 6 to 8 per cent moisture, and its gummy characteristics present a pre-crushing separation problem. To keep the clay from contaminating the finished material, the firm does a major scalping operation ahead of the crushing job. This is handled by the Universal Wobbler feeder, which has a reversible reject conveyor under the feeder. Ten per cent of the feed material passes through 3-inch openings between the Wobbler bars. If the material is clean, the separated fines are added to the crushed material from the Impact Master and all the material is conveyed to a screening tower. If the material is dirty, the reversible reject conveyor carries it off to the side for stockpiling.

The Universal Wobbler feeder operates on a 15-hp, high-torque electric motor at 1,800 rpm. The Impact Master operates on a 200-hp motor at 1,200 rpm.

A Lovejoy 3 to 1 variable-speed drive on the Wobbler feeder enables the operator to pace the feed flow of material into the Impact Master with the rate of crushing speed.

Crushed material reaches the screening tower by conveyor and passes over an adjustable speed, 3-deck, 5×14-foot Simplicity screen with self-feeding oilers. Material passing the screen is stored in three 23-cubic-yard bins; oversize is returned to the Impact Master for further reduction. THE END

"LARGEST FILL IN OHIO" is how C. F. REPLOGLE Construction Co., Circleville, Ohio, describes the 97-footer on its U.S. Route 40 relocation job. Other cuts and fills run between 80 and 90 feet – and up to 70% of the material is broken limestone and sandstone. This is tough on tires–but Goodyear Triple-Tough 3-T Nylon Cord TUBELESS tires take it even better than tube-type, cut earth-mover tire down time to new LOWS. Tubeless tires shown at work are (left to right) new wide-base Sure-Grip Lug, wide-base Hard Rock Lug and standard All-Weather.

Up to 80% cut in earth-mover tire down time—

plus many other advantages!

Goodyear TUBELESS tires end tube and flap troubles—causes of as much as 80% of earth-mover tire down time. They also end costs of tube replacement and many-item inventories.

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AND you save tires—for with Goodyear TUBELESS, small injuries usually show *before* they get serious.

Be sure *you* specify *Goodyear* TUBELESS tires on all new equipment—and see the *Goodyear* dealer for change-over of present vehicles. Goodyear, Truck Tire Dept., Akron 16, Ohio.

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ALL-WEATHER EARTHMOVER

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SURE-GRIP LUG

ROAD LUG

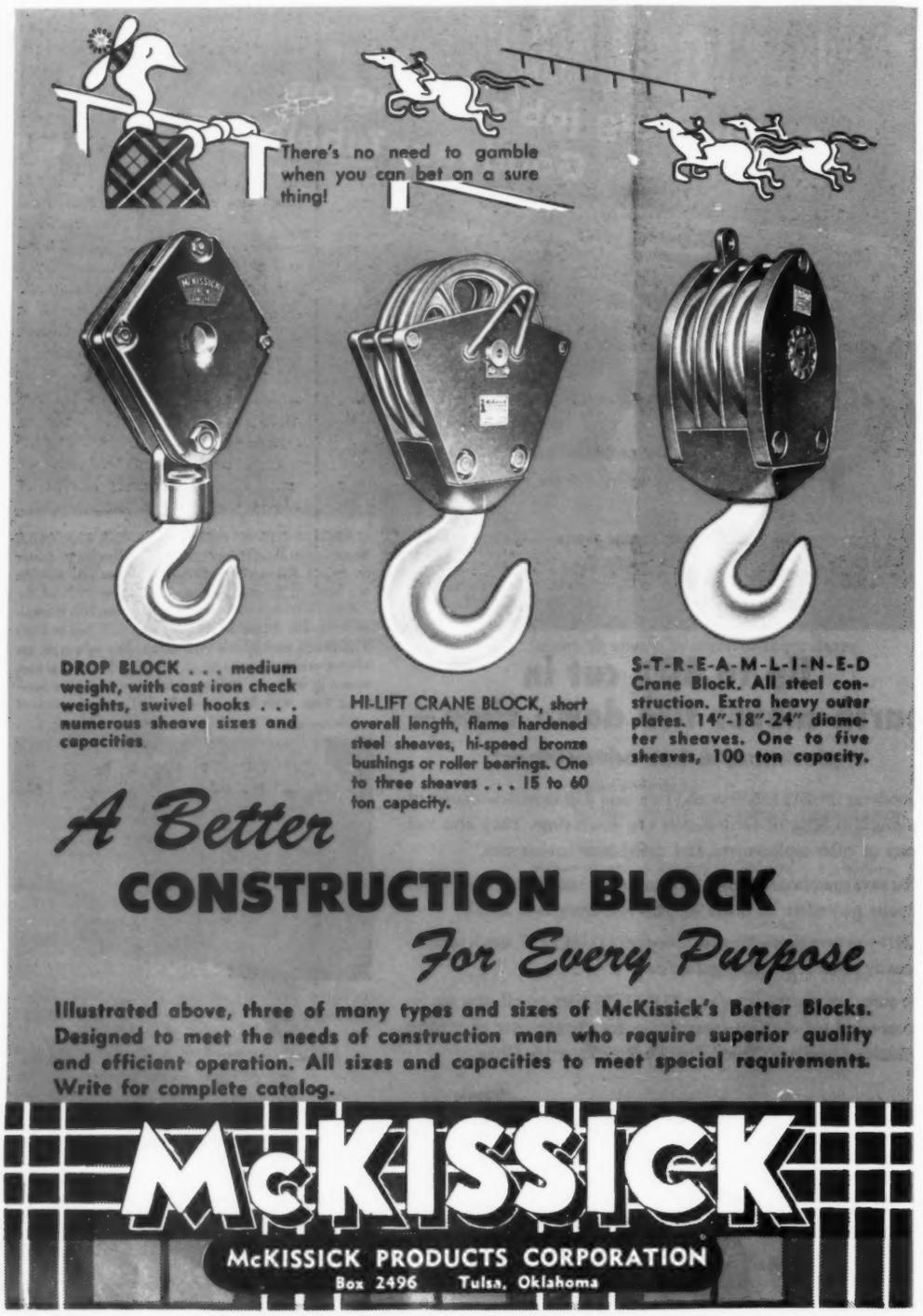
For more facts, use Request Card at page 18 and circle No. 202

Lengthen equipment life—and cut costs at the same time

Investments in road building equipment and expenditures for highway projects are at an all time high and are expected to increase still further during the next few years. Highway contractors have over 330,000 units of equipment available for expanded highway programs, and public highway departments have more than 381,000 pieces of equipment ready to maintain and improve existing roads. The outlays for highway construction have increased by two billion dollars since 1952. Of the total sum spent on construction operations, twenty per cent is devoted to equipment maintenance but *less than one per cent is spent on lubricants.*

Quality lubricants have been developed which will more than protect moving parts under the severe conditions encountered in construction operations. Since the cost of good lubrication is almost negligible as compared to the value of the equipment, it should be evident that compromising with lubricant quality is false economy.

Operating costs can be reduced to a minimum and equipment life can be extended to the utmost by: (1) adopting a simplified lubrication plan which will keep the number of lubricants to a minimum; (2) storing and handling lubricants in accordance with accepted established practices; (3) applying lubricants properly; and (4) establishing a lubrication and preventive maintenance program and following it to the letter. Here is a practical program.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Proper lubrication is vital to the successful and efficient operation of any piece of equipment. This is particularly true for today's modern machines with their increased speeds and loads and closer tolerances and clearances. However, there are certain factors peculiar to the construction industry which make lubrication an even more critical item.

The speed with which a contractor completes a job is a big factor in determining whether he makes a profit or suffers a loss. Equipment must be kept in operation if the job is to be finished on schedule or ahead of time. Machinery that must be taken off the job for repairs can increase construction costs. Proper lubrication practices will go a long way toward keeping the equipment on the line.

Also, the environmental conditions under which construction equipment must operate are about the most adverse that can be found. Operation in dirt, mud, water, and extremes of weather conditions is the rule rather than the exception. Thus, the problem of contamination is a very serious one. The importance of keeping contaminants away from precision bearings, gears, and other moving parts of a piece of equipment cannot be emphasized too strongly. Modern construction machinery has been designed so as to seal out contaminants as much as possible. However, it is only through the application of good lubrication and preventive maintenance practices that the costly damage of contamination can be averted.

Efficient and economical operation of roadbuilding equipment can be realized by adhering strictly to four rules: 1. select quality lubricants; 2. store them properly; 3. dispense them carefully; 4. instigate a sound preventive maintenance program.

Simplified lubrication plan

One of the problems confronting a contractor is the proper choice of lubricants. On jobs where the number and variety of equipment are great, there is a tendency to stock more types of lubricants than may be necessary. For example, a survey of equipment on a small road job revealed that 21 different lubricants were being used, including five motor oils, four gear oils, three cable lubricants, six greases, a track roll lubri-

...u can do both with a sound preventive maintenance ...gram and care in the selection, storage, and use ...lubricants

B. WEETMAN and R. K. GOULD
Research & Technical Dept.
The Texas Co., Beacon, N. Y.

Operating conditions like this demand good lubrication and maintenance practices if equipment is to continue working at maximum efficiency.

cant, a cylinder oil, and a hydraulic oil. The use of such a large number of products presents a storage problem, and also invites the possibility of confusion and misapplication of lubricants.

After a considerable amount of study of the lubrication requirements of roadbuilding equipment, a simplified plan has been devised. Although the individual units used may vary considerably in design and function, they have many parts which are basically similar from the lubrication standpoint. Actual experience on construction work, which has been confirmed by the Military, indicates that six basic types of lubricants can satisfy the requirements of nearly all construction machinery. These lubricants are identified in the chart (p. 8), with the parts to be lubricated and the suggested interval between applications. Each of the lubricants has basic characteristics.

Engine oils

Gasoline and diesel engines powering roadbuilding equipment require a crankcase oil which will provide oxidation stability, corrosion resistance, extreme pressure and anti-wear properties, rust protection, foam prevention, and detergent-dispersant characteristics to hold combustion products in suspension. These properties have been built into the heavy-duty-type engine oils. Most of the engines in use are satisfied by an oil meeting Military Specification MIL-O-2104A. If an engine manufacturer specifies the need for an oil of higher detergency, such as "Supplement I," "Series 2" or "Series 3" oil, the oil supplier should be consulted and requested to provide a product meeting these requirements.

Gear oils (EP type)

Straight mineral oils can be used satisfactorily on certain gears, such as the ordinary spur or spiral-bevel-type, where rolling contact occurs between the gear teeth. However, where there is sliding contact between the gear faces, as in hypoid or worm gears, an oil with oiliness and extreme pressure properties is required to prevent scoring under heavy loads. Good gear oils of this type will absorb shock loads in the heaviest drives

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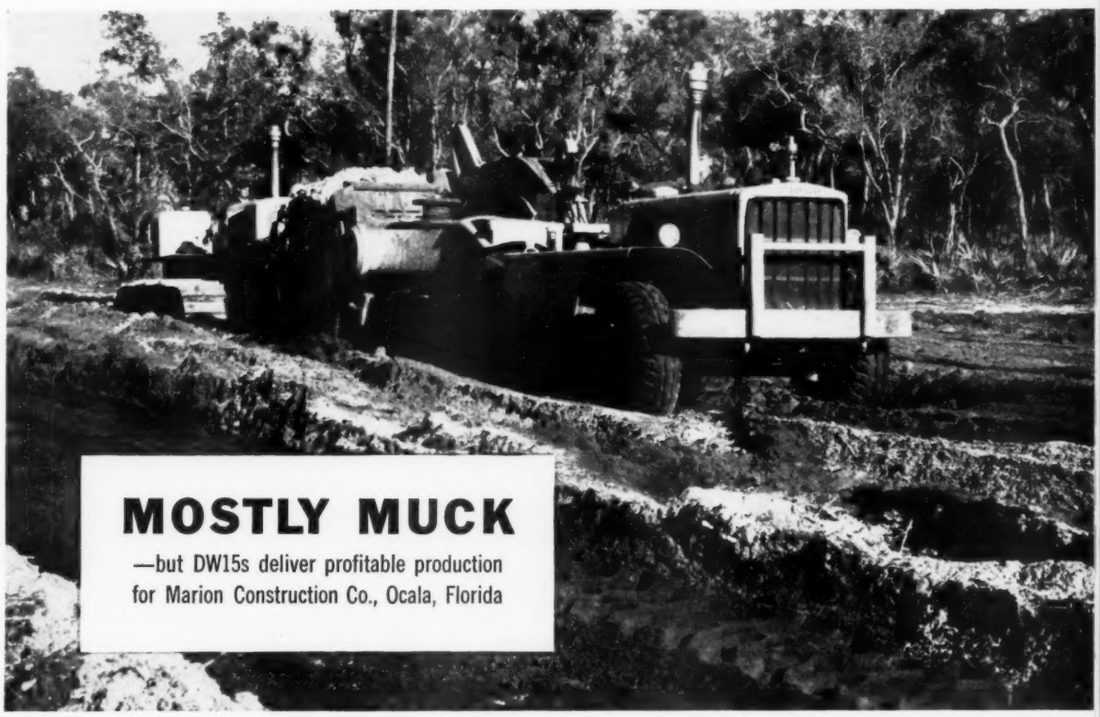

MOSTLY MUCK

—but DW15s deliver profitable production for Marion Construction Co., Ocala, Florida

This is one of four CAT* DW15s with scrapers building a 15.5-mile stretch of 2-lane blacktop on U. S. 1 between Jacksonville and St. Augustine. A D8 is push-loading it. This job is only 3 feet above sea level, and the material is wet and heavy. There are some 370,000 cu. yd. to be excavated and moved for fill on the stretch.

Marion Constr. Co. is making 2 uses of the borrow pits: (1) to get fill and (2) to provide drainage ditches for the road. On 6,000-foot round-trip hauls, the DW15s averaged 150 cu. yd. an hour each. They worked 10 hours a day, 6 days a week. According to Vice President Shaw Pearsall they performed excellently and with a minimum of down time in the tough going.

Now a new DW15 (Series E) Tractor with a new No. 428 LOWBOWL Scraper

All rugged yellow machines are engineered to handle the *hard* work profitably. But, as productive as they are, Caterpillar is constantly looking for ways to improve their performance. When a new model has been thoroughly job tested, it is made available. And that's the case of the new DW15 (Series E)-No. 428 LOWBOWL Scraper. The high torque Cat Engine delivers 200 HP (maximum output capacity). With speeds up to 37.2 MPH, plus the extra sure-footedness of four wheels, the DW15 gives you faster hauls and cycle times with greater safety. The No. 428 Scraper has a capacity of 13 cu. yd. struck and 18 cu. yd. heaped. Because of exclusive LOWBOWL design, it loads quicker and more easily than any unit of its capacity—another factor in high production at low cost.

For complete details about the new DW15, see your Caterpillar Dealer.

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Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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(Continued from preceding page)

without losing their load-carrying properties and will be resistant to oxidation, thickening, foaming, and corrosion. They will also provide some protection against misalignment. Consequently it is good practice to use them in all gear boxes.

Gear oils (adhesive type)

Open gears require a lubricant which will cushion shock loads, minimize noise, and reduce wear. It must not channel or throw-off, but should cling to tooth surfaces even at high pressures, temperatures, and peripheral speeds. Lubricants satisfying these requirements are very adhesive and also contain special additives which impart unusually good resistance to water washing. Their fine penetrating and water-resistant characteristics make them ideal as wire rope lubricants. They seal each strand in a tough, viscous film to reduce internal friction and wear, keep out moisture, prevent corrosion, and extend rope life.

Hydraulic oils (premium grade)

In addition to acting as a physical medium for transmitting power, hydraulic oils lubricate pumps, cylinders, and other system components. Premium oils are fortified to prevent wear and rust and to resist oxidation, sludging and foaming.

Multipurpose, heavy-duty greases

These are generally lithium base products with high dropping points. They should have an oil heavy enough to withstand heavy wheel bearing loads. The grease must resist water contamination, resist shear breakdown, and be capable of being pumped at low temperatures. The term multipurpose covers a great deal of territory. The integrity and reputation of the lubricant supplier are the best assurance the user has that a given grease meets all these stringent requirements. If there is any doubt that a given product can handle all the grease lubrication jobs shown in the table, it is best to use a separate grease for wheel-bearing lubrication, since this is the most critical requirement.

Track roll lubricants

Two types of product are available. One is a soft grease designed for use in track rollers using roller bearings and metal-to-metal seals. It needs to have good oxidation and mechanical stability. The other is a semi-fluid stringy compound which is used in lubricating the plain bearing type. It must flow out of the seals slightly, sealing against entry of dirt and water.

These, then, are the basic properties and characteristics of six types of lubricants which will satisfy most of the main lubrication requirements of road construction equipment. This simplified plan is flexible and can be modified and adjusted to meet any given situation. It should be regarded as a guide in assisting operators of construction equipment to reduce their inventory of different kinds of

SIMPLIFIED LUBRICATION PLAN FOR ROAD CONSTRUCTION EQUIPMENT

Part Requiring Lubrication	*Lubrication Interval, Hours*	*Lubricant Type Used** 90-32°F.	32-10°F.
Engines – Gasoline, LPG and Diesel	100	Heavy Duty Engine Oil	
Engine Accessories – Oil Lubricated	100	SAE 30	SAE 20-20W
Oil can points – Moderate Loads	As required		
Gear Boxes – Transmissions, Differentials	1000		
Chain Drives	100	Extreme Pressure Gear Lubricant	
Flexible Couplings	1000		
Universal Joints	1000	SAE-140	SAE-90
Other Oil Lubricated Parts – Severe Loads	10		
Hydraulic Mechanisms (Except fluid transmissions)	1000		
Air Compressors – Reciprocating and Rotary	200	Premium Grade Hydraulic Oil	
Electric Motors and Generators Oil Lubricated	1000	SAE-30	SAE-10W
Grease Fittings –			
Linkages, Plain Bearings, etc.	10	Multipurpose Heavy Duty Grease No. 2	
Ball and Roller Bearings	100		
Hand-Packed Bearings	100		
Wheel Bearings	1000		
Track Rollers	10	Track Roll Lubricant	
Exposed Gears	As required		
Railroad Traction Motor Gears	As required	Adhesive Type Gear Lubricant	
Wire Ropes and Cables	As required		

Where standard SAE or NLGI viscosity and consistency specifications apply, they are shown for each temperature range. In other cases, lubricant suppliers should be consulted for proper grade.

Panoramic photo shows over-all magnitude of the Pittsburgh Disposal Plant Project and the tremendous task force of equipment needed to carry it out. Principal lubricants used are *Texaco Ursa Oil Heavy Duty* for al

"We're out to earn a bonus on a $100,000,000 project..."

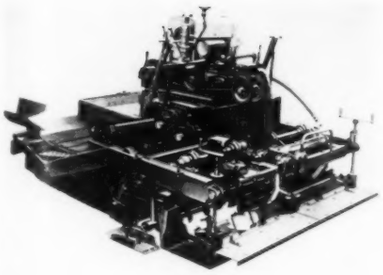
"and that means every piece of construction equipment must deliver its full share without down-time. That's why we set up a special Texaco Lubrication Plan right at the start," says *Maintenance Supervisor J. B. Metz of McHugh-Allegheny-Drake Contractors.*

Prior planning has paid off for McHugh-Allegheny-Drake. Maintenance Supervisor Metz reports wonderful results:

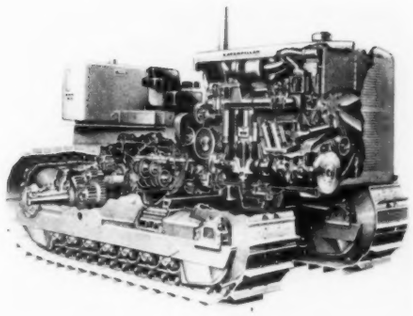
"The equipment works in damp, steamy excavations, breathes churning dust, pounds its bearings unmercifully, and still delivers top-rate performance. Down-time is limited to routine maintenance, thanks to the excellent Lube Plan of the Texaco Lubrication Engineer."

TEXACO

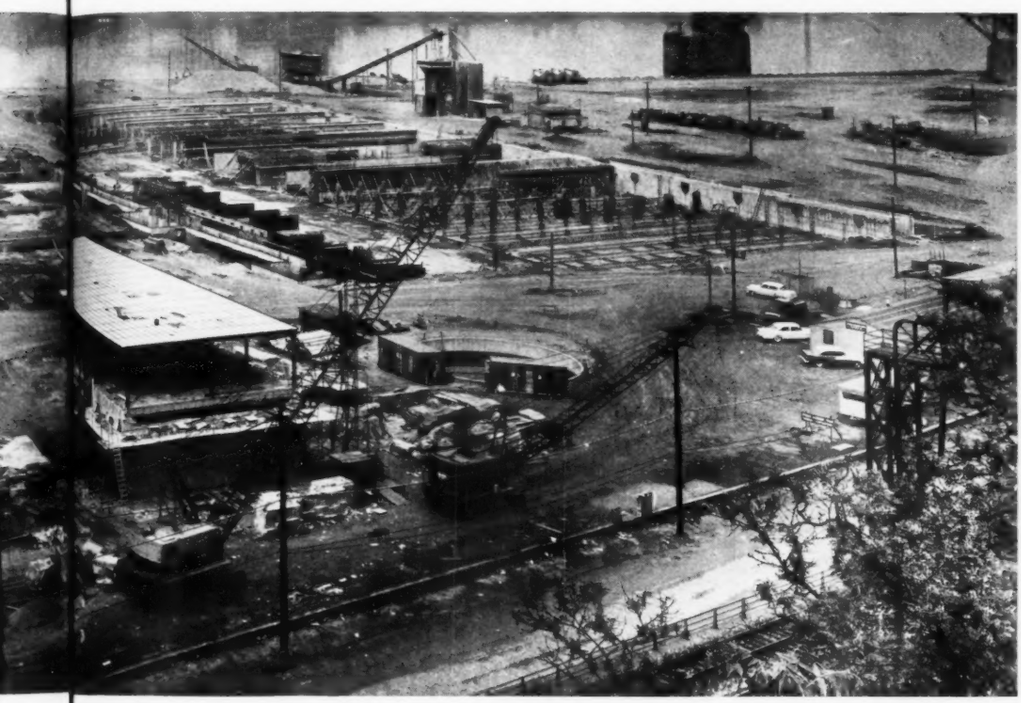
TEXACO



Bituminous spreaders have many moving parts that require proper lubricants to insure trouble-free operation.



This cutaway view shows the engine and working parts that require quality lubricants and good maintenance practices if the rig is to be kept in top working condition.



engine lubrication; *Texaco Marfak Heavy Duty 2* for wheel bearings and general grease lubrication; *Texaco Regal Oil R&O* for air compressors; and *Texaco Meropa Lubricant* for transmissions and differentials.

KING-SIZE PUMP-WELL . . .

Since last year, the construction equipment of the McHugh-Allegheny-Drake contracting company has been digging what amounts to the biggest ever dug.

The Pumping Station excavation will handle all the sewage to be received in Pittsburgh's new $17,000,000.00 Sewage Treatment Plant. Two more years will be needed to finish the job.

Even before it began the job, the firm asked to "see a Texaco Lubrication Engineer," who helped draw up a Lubrication Plan covering the entire job. Not only manufacturers' lubrication charts were considered. Weather, terrain, work loads, garaging were all weighed together before the proper Lubrication Plan was chosen. The Plan's lubricants are delivered locally from one of Texaco's 2,000 Distributing Plants.

SHOULD *YOU* CALL THE TEXACO LUBRICATION ENGINEER?

Before you do, you might want to know what he does:

1. He surveys your equipment and conditions. (Working conditions are important.)
2. He recommends specialized Texaco lubricants to meet the specific requirements of the job. (His choice may differ from yours—*ask him why!*)
3. He arranges local stocks for the items you'll need, to keep your costs low, your service routine.
4. He watches the progress of your Lubrication Plan, and adjusts it to changing conditions.

HOW CAN YOU GET IN TOUCH WITH HIM?

Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States—or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

Lubricants and Fuels
FOR ALL CONTRACTORS' EQUIPMENT

For more facts, use Request Card at page 18 and circle No. 205

lubricants to a minimum with the assurance that their machines will be lubricated satisfactorily.

Although the recommendations outlined cover the vast majority of equipment, there may always be certain exceptions or conditions which will necessitate special lubricant recommendations. For example special products may be required for such applications as water pumps (shaft seal type), fifth wheels, electric motors and generators (anti-friction), rock drills, steam cylinders, waste-packed car journals, brake-drum bearings on power shovels (severe service), concrete forms, and rust proofing of equipment in storage.

Also, it is not advisable to make a general blanket recommendation for torque converters and hydraulic couplings. Since there are wide variations in lubricant requirements for these components, product recommendations should be made on an individual basis.

Storage and handling

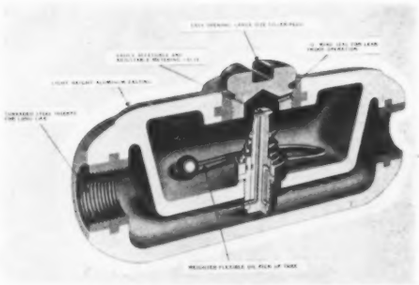
The petroleum supplier takes every precaution necessary to assure that lubricants are in the best possible condition when delivered to the customer. The user, likewise, should exercise equal care to see that when a lubricant is applied, it is in the same good condition as when it was received.

Many things can happen to a lubricant between the time it is received by the customer and the moment it is applied. Such things as careless handling, contamination, confusion of brands, exposure to extreme temperatures, and leakage can result in damaged equipment, excessive maintenance cost, and lost productive effort. The conditions under which a contractor must store and handle lubricants are particularly hazardous from the standpoint of contamination and exposure to temperature extremes. Consequently, he should be unusually careful to see that nothing detrimental happens to them.

Here is a list of some "do's and don'ts" that apply to the storage and handling of lubricants.

1. Choose the storage area carefully. Select a central location so that hauling distances are as short as possible. Also select an area where the

(*Continued on next page*)



Air-line lubricator insures proper lubrication and high production from rock drills and air tools.

(Continued from preceding page)

atmosphere is free from dust and vapors.

2. Store lubricants indoors if possible—the chance of contamination will be less.

3. If stored outdoors, drums should be placed on their sides and on racks. Do not lay them on the ground. When drums are placed upright on end, rain water may accumulate and be sucked into the drum by the normal breathing action. If drums are stored outdoors on end, even temporarily, cover should be available in the event of inclement weather.

4. Cleanliness is essential regardless of whether storage is indoor or outdoor.

5. Orderliness is another must. By keeping different brands and types of lubricants separated and in their proper places, there is less chance for confusion and error.

6. Do not store more products than necessary. The lubricant supplier will be glad to make a survey of lubrication requirements with a view to keeping the number of different products to a minimum. This also will reduce chances of confusion.

7. Exercise extreme care in heating products that have been exposed to low temperatures. If possible, transfer drums to a warm area and allow the lubricant to reach room temperature. If more rapid heating is required, use exhaust steam. Never apply direct heat, such as a flame, to exterior of the drum. This could melt the sealing compound and cause leaking. It might also harm the product.

8. Remember that exposure to temperature extremes can damage lubricants. If there is any reason to suspect that this condition has occurred, examine the lubricant before putting it to use. If the product appears abnormal, consult the lubricant supplier. The lubricant may have to be discarded or it may be salvaged.

Application

On construction operations in particular, it is most advisable to apply the lubricant directly from the original container. The elimination of intermediate transfer receptacles erases a very serious source of contamination. Dispensing equipment is now available to fit all of the standard containers used to package lubricants and greases. They permit the product to be removed from its original container with no danger of contamination, waste, or mess.

Preventive maintenance

To the contractor striving to complete his job on time, equipment maintenance is (or should be) of prime importance. A piece of machinery which must be pulled off the job for repairs represents lost time. Also, equipment not operating at top efficiency can have far-reaching effects. For example, a sluggish push tractor may upset the smooth operation of an entire fleet of scrapers; the breakdown of a single haul unit may mean delays to a big loader; and the breakdown of a loader—even for a short time—may delay a long series of operations.

Experience proves that in the long run it pays to take care of equipment on the job. A program of preventive maintenance, well planned and properly executed, will pay for itself over and over again. For example, it is much cheaper to keep a bearing adjusted than it is to buy new bearings, shafts, and gears that become damaged when unadjusted bearings fail. Major breakdowns, lost

NOW...DOUBLE LOAD... DOUBLE PROFIT

WITH Clement BONUS LOADER DUALS

Here's how to double your hauling capacity with present tractors and personnel. You hitch one, tow one, with the new Clement Bonus Loader Dual Trailer.

Fast, rugged and maneuverable, Clement Duals can jackknife turn in as little as 31 feet. Cab-operated controls and full-width spreader gates let you dump-on-the-run. You haul more . . . more profitably . . . at lower cost in tractors and drivers.

Designed by Clement, inventor of the cable-lift dump trailer, the new Clement Duals have been field-proved on hardest quarry and construction projects.

Get the Dual Profit picture from your nearest Clement distributor or write today to . . .

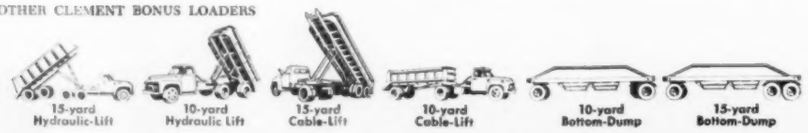
CLEMENT BRASWELL, INC.
Shreveport, Louisiana

Clement

Limited number of Clement distributorships open in key states to qualified heavy equipment dealers.

DISTRIBUTORS: H. C. Blackwell, Jr., *Adamsville, Alabama* • Shipley Trailer & Equipment Company, *Fort Smith, Arkansas* • Strange Truck & Equipment, Inc., *West Sacramento, California* • Colorado Springs Equipment Company, *Colorado Springs, Colorado* • Hawkeye Truck Equipment Company, *Des Moines, Iowa* • Gulf States Sales, Inc., *Shreveport, Louisiana* • Road Machinery & Supplies, *Duluth and Minneapolis, Minnesota* • Highway Trailer Sales, Inc., *Kansas City, Missouri* • M & F Equipment Company, *Albuquerque, New Mexico* • Swanston Equipment Company, *Fargo, North Dakota* • Visintine Equipment Corporation, *Columbus, Ohio* • Herd Equipment Company, *Oklahoma City, Oklahoma* • Schetky Equipment Corp., *Portland, Oregon* • Beckman Trailer Sales, *Fort Worth* • I. F. Nelis Associates, *Houston* • Western Trailer Company, *Lubbock, Texas* • Transport Equipment Center, *Salt Lake City, Utah* • Wisconsin Highway Trailer Corp., *Green Bay, Wisconsin.*

OTHER CLEMENT BONUS LOADERS



15-yard Hydraulic-Lift | 10-yard Hydraulic Lift | 15-yard Cable-Lift | 10-yard Cable-Lift | 10-yard Bottom-Dump | 15-yard Bottom-Dump

For more facts, use Request Card at page 18 and circle No. 206

time, and high operating costs can be kept to a minimum by keeping parts lubricated, tightened, and adjusted. Furthermore, an operator whose equipment is always in good condition is very apt to be a happy, satisfied employee.

Since no two jobs are exactly identical, the actual details and execution of preventive maintenance programs will necessarily vary from job to job. However, there are a few basic concepts which are common and essential to all successful programs.

1. Set up a definite schedule for lubrication and mechanical check-ups and *stick to it*. Any program will begin to fall apart and become ineffective once exceptions are made and one starts to "cheat" on the original schedule. For example, if it is found that the interval between lubricant changes can be increased a certain amount with no apparent adverse effect, the natural tendency then is to extend it further and further. This will inevitably lead to disaster.

2. If possible, have the preventive maintenance work performed on an off-shift. This will cause a minimum of interference with work.

3. Assign men to this job who are familiar with lubricants and who are thoroughly acquainted with the equipment. The consequences of not doing so are too serious to entrust this work to uninformed personnel.

4. Keep accurate records of the servicing done on each piece of equipment. This need not be a complicated procedure. A few simple check marks on a printed form are all that is required. A study of such records will usually serve as a warning of possible trouble. For example, excessive oil consumption is evidence of poor lube fittings or oil leaks—items which can be checked at once by the mechanic. Also, these records will indicate when the machine is nearing the overhaul stage.

5. Keep on hand a stock of parts and expendable supplies. If these are available when needed, equipment requiring new parts will be out of service for a minimum amount of time.

6. Clean equipment before servicing. On the face of it, this may seem ridiculous since the machines will become dirty again as soon as they are put back in service. However, there are two good reasons for following this practice. First, the lubrication fittings will be uncovered, and the chances of any points being missed will be reduced. Fittings caked over with mud may be overlooked. Second, there is less chance of dirt from the machine contaminating the lubricant at the moment of application.

These, then, are some points that should apply to any good preventive maintenance program. As mentioned earlier, the actual details of carrying out such a program must be worked out for each individual job. Usually, it is more difficult to set up an ideal program on short-term jobs than on those that last for an extended period. As far as lubrication is concerned, the critical points are those which must be lubricated frequently; the critical time is at the start of the job.

THE END

For more facts, circle No. 207 →

ASCE appoints 13 members to executive committees

The American Society of Civil Engineers has appointed 13 new members to the executive committees of technical divisions. All of the men will serve four-year terms. The members and the committees are: Ronald M. White, air transport; Everett B. Mansur, city planning; Walter L. Couse, construction; Egor P. Popov, engineering mechanics; and John O. Morton, highway.

The roster also includes Kenneth Q. Volk, irrigation and drainage; William T. Ivey, pipeline; John F. Bonner, power; Thomas M. Leps, soil mechanics and foundations; and Lewis A. Young, sanitary engineering. The other new members are Elmer K. Timby, structural; Earle J. Fennell, surveying and mapping; and Col. Lawrence B. Feagin, waterways and harbors.

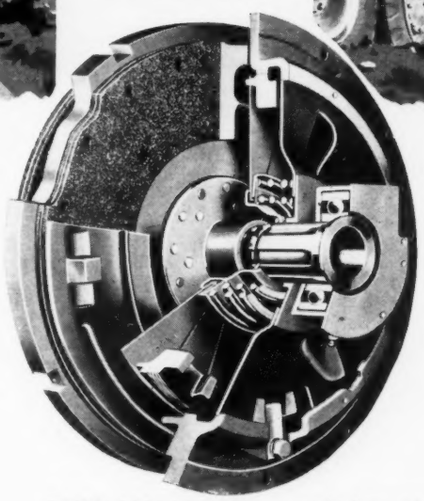
Budnik joins Kaiser Engineers division

C. A. Budnik, civil engineer and veteran heavy industrial construction manager, has joined Kaiser Engineers, Division of Henry J. Kaiser Co., Oakland, Calif. Budnick has been named the assistant manager of the firm's Industrial Construction Division.

His work will cover construction at aluminum plants and mills in Chalmette, La.; Ravenswood, W. Va.; and Gramercy, La.; a power plant in Monaca, Pa.; an engineering test reactor at Idaho Falls, Idaho; steel plant work at Fontana, Calif., and Aliquippa, Pa.; an ore beneficiation plant at Eagle Mountain, Calif.; and a petroleum refinery in Wilmington, Calif. Budnick is registered with the National Bureau of Engineering, and is a member of the American Society of Civil Engineers.

The driver with the rig that really delivers says:

"your power will produce *more* with a Spicer H-D CLUTCH!"



MASSIVE construction . . . materials of exceptional durability . . . and efficient design are outstanding Spicer Heavy-Duty Clutch features:

RELEASE PARTS WITH CLUTCH—The unit is complete with Release Bearing Assembly, Release Yoke and Cross Shafts ready for hookup to pedal linkage. No further engineering or procurement is required by purchaser.

LOWER HEAT ON SPRINGS—There is no direct contact between pressure springs and pressure plate, therefore, springs will not take a set and lose pressure due to heat.

REDUCED FRICTION—The knife edge design of the fulcrum points reduce friction which shows up as less pedal effort to release clutch.

BUILT-IN PARALLELISM—Multiple levers and central springs assure uniform pressure around entire circumference of pressure plate regardless of wear or adjustment.

Ask Dana engineers to help meet your particular power transmission requirements.

Spicer Clutch Driven Disc Types to Meet Every Need

DANA Spicer

DANA CORPORATION • Toledo 1, Ohio

DANA PRODUCTS Serve Many Fields:

AUTOMOTIVE: Transmissions, Universal Joints, Propeller Shafts, Axles, Power-Lok Differentials, Torque Converters, Gear Boxes, Power Take-Offs, Power Take-Off Joints, Clutches, Frames, Forgings, Stampings.

INDUSTRIAL VEHICLES AND EQUIPMENT: Transmissions, Universal Joints, Propeller Shafts, Axles, Gear Boxes, Clutches, Forgings, Stampings.

AVIATION: Universal Joints, Propeller Shafts, Axles, Gears, Forgings, Stampings.

RAILROAD: Transmissions, Universal Joints, Propeller Shafts, Generator Drives, Rail Car Drives, Pressed Steel Parts, Traction Motor Drives, Forgings, Stampings.

AGRICULTURE: Universal Joints, Propeller Shafts, Axles, Power Take-Offs, Power Take-Off Joints, Clutches, Forgings, Stampings.

MARINE: Universal Joints, Propeller Shafts, Gear Boxes, Forgings, Stampings.

Many of these products manufactured in Canada by Hayes Steel Products Limited, Merritton, Ontario

The headquarters for Ohio Machinery Co., Cleveland, was built a year after the firm was founded. Its stockroom, repair shops, IBM room, and many lines of equipment are designed for top-notch service to contractors.

distributor doings

Ohio dealer expands with growth of work in sta

The growth of most dealerships is naturally keyed to the amount of construction in the surrounding vicinity. But mining and industrial developments have also contributed to the phenomenal growth of Ohio Machinery Co., Cleveland, Ohio.

The dealer is located in a state which ranks 35th in land size, fifth in population, and second in manufactured products. This has contributed to the boom in the construction of factories, homes, schools, shopping centers, sewage and water treatment facilities, and the need for some 90,000 miles of highway. Keeping pace with the state's growth, Ohio Machinery built two branch offices, at Toledo in 1948 and at Youngstown in 1950.

A third branch, started at Cadiz in 1952, is in the heart of the coal-producing area and does a profitable business selling heavy-duty earth-moving equipment to coal-producing companies that operate strip mines.

Synchronized operations

With the four offices serving all phases of construction in 63 of the 88 Ohio counties, strict accounts must be kept on the parts, equipment, and bills. Keeping close tabs on the $1,750,000 worth of stock parts are automatic reference machines installed by the International Business Machines Corp. Each branch office is equipped with an IBM key-punching machine and files, and a key-punch card is made for each stock item.

At the Cleveland headquarters, the IBM room is equipped with two key-punch machines, one verifier, two sorters, two collectors, one 402 tabulator, one 403 tabulator, two reproducers, and one calculator. All these machines, operated by eight to ten clerks, handle the monthly billings for all the branches, the automatic billings to customers, and the re-ordering of parts for all branches. To these operations are added quarterly automatic recommendations for ordering parts that have not been kept on hand, but have been requested in the past.

This system has eliminated the over and under stocking of parts while increasing the efficiency of inventory maintenance. Each branch can now fill 99 per cent of all requested parts within 24 hours. This fast-moving inventory procedure provides an excellent service to customers and also helps build a reputation that is of prime importance in the equipment business.

←For more facts, use coupon or circle No. 208

SAVE MANPOWER

ON CONCRETE JOBS WITH Whiteman EQUIPMENT

One man with a Whiteman Power Buggy can pour as much concrete in one day as five men with hand buggies. Speed over narrow runways up to 16 m.p.h., up 25% grades. Never tire or slow down. Rugged. Reliable.

Maximum efficiency is achieved with Whiteman Vibrators. Built for outstanding performance and durability to highest Whiteman standards. Three models, gas and electric, for every requirement.

Only half the manpower is required to operate a Whiteman Screeding Machine. Does a better job, too. Vibrates throughout entire area, compacts slab, screeds to perfect level. Width adjustable 3 to 24 ft.

The work of six men with hand trowels can be done with just one Whiteman Finishing Machine . . . and far better. Produces an extremely smooth, level slab. Perfected over 17 years. 11 models for every requirement.

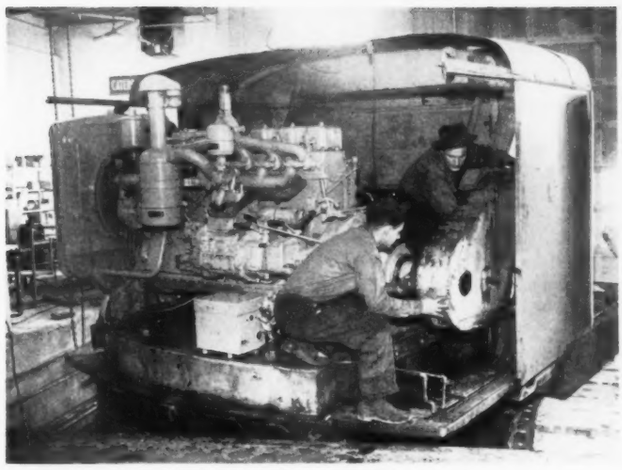
Whiteman

THE LEADER IN CONCRETE EQUIPMENT

TRUCK MIXERS | POWER BUGGIES | VIBRATORS | SCREEDING MACHINES | FLOATING-FINISHING MACHINES

WHITEMAN MANUFACTURING CO. DEPT. CE
13028 Pierce St., Pacoima, Calif.
Please send prices, catalogs and name of distributor for
☐ Power Buggies ☐ Screeding Machines ☐ Vibrators
☐ Floating-Finishing Machines ☐ Truck Mixers.
Name
Firm
Address
City Zone State

Efficient sales and maintenance force in four offices keeps increasing Ohio Machinery Co.'s list of customers



At one of the branch offices, two mechanics equip a Browning crane with a Caterpillar diesel engine. In these well-equipped maintenance shops, major repairs are quickly carried out with specialized mechanics, tools, and equipment.

Engineering service

Another reputation-builder of equal importance to a dealer is engineering service. At the Cleveland headquarters, Ohio Machinery has an engine department staffed by design engineers who handle the installation design of Caterpillar diesel engines. The engineers analyze power requirements of an installation, then recommend and design the engine hook-up without charge to the power user. This service is important for any customer who wishes to convert an existing system, such as power equipment, standby generators, or anything that requires design for proper installation and performance of diesel engines in a new converted setup.

Ohio Machinery has developed a testing device used on fuel injectors on Caterpillar diesels. The method and apparatus, developed about seven years ago, is now being used by many Caterpillar dealers throughout the country. The testing equipment simulates the internal pressures of diesel engines so that injectors can be tested for operating ability.

The organization of this efficient setup can be attributed to Harold N. Graves, founder and president of the firm. In 1945, Graves took over an existing Caterpillar dealership in Columbus, which was trying to cover the entire state from that city. This was unrealistic in view of the statewide industrial expansion then under way. Graves immediately supplemented the line of Caterpillar equipment with that of Thew-Lorain cranes and shovels. A year later he moved the dealership to Cleveland because of the vast amount of construction activity going on in Cuyahoga County.

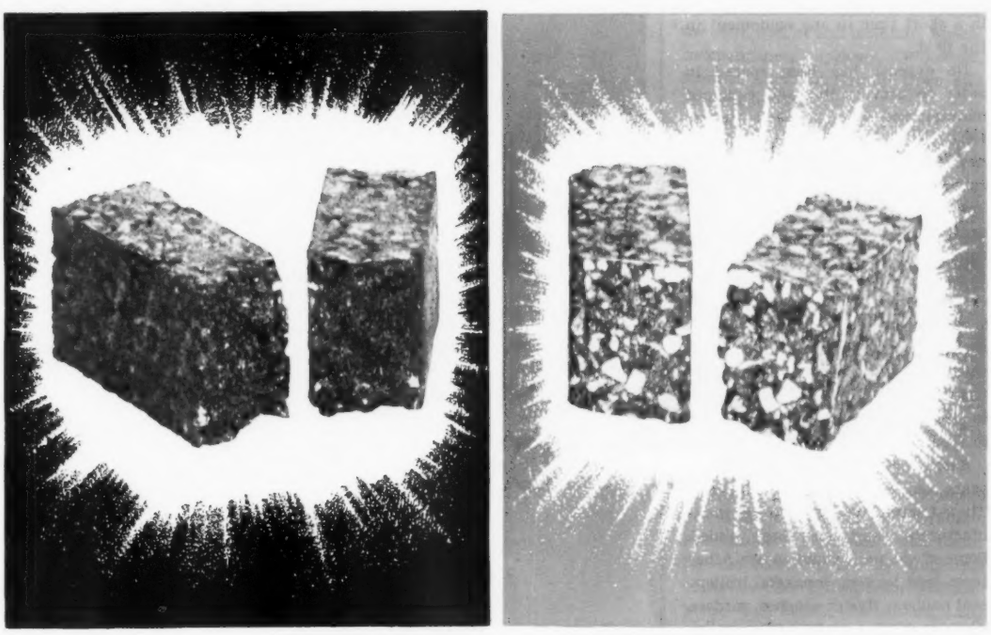
Business grows

When the dealership started, there was a total of three salesmen handling all phases of the business. Now, a sales force of 17 men visits equipment users and customers. When any equipment is purchased, the salesman and a mechanic accompany the rig during shipment to the new owner. The mechanic will stay with the unit a day or longer to make sure that the owner fully understands the proper use and maintenance of the machine. The mechanic makes a second visit within three months of delivery to learn if there have been any equipment problems and if the unit has been broken in properly.

(*Continued on next page*)

Naugatuck SURFA-SEALZ

RUBBER ADDITIVE FOR ASPHALT PAVING



This picture proves a point

THESE paving-surface specimens, compacted of aggregate and asphalt for standard impact tests, were forcibly broken apart by weights dropped from above. Just *how* and *where* they parted speaks volumes for the addition of *rubber* to asphalt or bituminous cement!

The specimen on the left (#1) contained *no* rubber; while the one on the right (#2) contained Surfa-Sealz® in the recommended proportion. It is quite evident that specimen #1 cracked and separated *through the asphalt*. On the other hand, in specimen #2, the very stones in the aggregate actually fractured before the rubberized asphalt binder yielded, under an impact many times greater than that which split specimen #1.

Call this a labortory test if you will, but what more convincing and practical demonstration is needed to prove the greater toughness and adhesion which Surfa-Sealz adds to asphalt? The advantages are even more pronounced at winter temperatures.

Very little imagination is needed to translate these facts into terms of more crack-resistant highway surfaces and greatly reduced maintenance costs.

US RUBBER **United States Rubber**

Naugatuck Chemical Division

Naugatuck, Connecticut

BRANCHES: Akron • Boston • Chicago • Memphis • New York • Philadelphia • **Mfg.:** Naugatuck • Gastonia • Los Angeles • **CANADA:** Latex Div., Dominion Rubber Co., Ltd., Montreal • **Cable:** Rubexport, New York
Rubber Chemicals • Synthetic & Reclaimed Rubber • Plastics • Agricultural Chemicals • Latices

For more facts, use Request Card at page 18 and circle No. 209

This used Caterpillar Traxcavator and tractor are being serviced in the repair bays of the Cleveland branch.

(Continued from preceding page)

Ohio Machinery also maintains a total of 38 service trucks which, due to the strategic locations of the branches, are no more than two hours away from any equipment user in Ohio. With this fleet of trucks, the company can bring service and repair in a short time to any equipment in the field.

No expense has been spared in order to provide the well equipped maintenance shops at each branch. Here, major repairs, such as adding new life to worn track rails with the submerged-arc welding process, allow volume production and lower unit costs for this work. Specialized equipment and tools allow mechanics to do a faster job, also reducing labor costs. Another saving on labor costs is made by replacing worn assemblies, such as starting engines or clutches, with rebuilt ones. Ohio Machinery has found that it takes half the time to replace the assemblies that it takes to repair them.

Since the dealership opened 12 years ago with the Caterpillar and Thew-Lorain lines, many other manufacturers' lines have been added. Some of the units handled are Athey force-feed loaders, breakers, trailers, coal haulers; Hyster winches, yarders, donkeys, logging arches; Fleco rakes, stumpers; and Page dragline buckets. Other equipment on display includes Owen clamshell buckets; Martin trailers; Chester tamping rollers; and Union Wire Rope slings, chokers, and wire.

Men behind success

Harold N. Graves learned about the equipment business with the LaPlant-Choate Co., Cedar Rapids, Iowa, where he rose to be vice president of sales. It was during this association with LaPlant-Choate that Graves met Forrest W. Clemens who was comptroller of the company. Clemens joined Graves in 1945 as treasurer of Ohio Machinery, and now also doubles as general manager.

Tom Taylor, vice president and general sales manager, has been with the firm since its founding. He was originally with the Caterpillar dealer in Columbus, and joined Ohio Machinery when they took over the account. Before that, Taylor was the Ohio regional sales manager for Euclid. Together, they make a team tough to beat in Ohio. THE END

distributor doings

Oregon distributor elects officers

E. H. Hogl has been elected director and vice president of Interstate Tractor and Equipment Co., Portland, Oreg.

Other officers for this Oregon-owned-and-operated distributor for Thew-Lorain shovels and Moto-Cranes, Euclid earthmoving equipment and Chicago-Pneumatic air compressors and equipment are: Mrs. Collis Johnson, vice president; Carl E. Davidson, secretary-treasurer; E. W. Benson, assistant secretary; A. K.

Director and vice president of Interstate Tractor & Equipment Co. is E. H. Hogl.

DOES THE KING OF THE CRAWLERS PAY ITS WAY?

Let's talk push-loading. We'll use some figures—that's the only way to tell a dollars-and-cents story.

On a job in Munsing, Michigan, not long ago, a Caterpillar D9 Tractor and a competitive machine were both push-loading in moist sand with some gravel in it. The other machine loaded 18.3 cu. yd. in .91 min. That's 20.1 cu. yd. a minute. The D9 pushed 18.5 cu. yd. into the scraper in only .58 min. That's 31.9 cu. yd. a minute. In other words, the D9 loaded over 50% faster than the other machine, and developed a larger load while doing it.

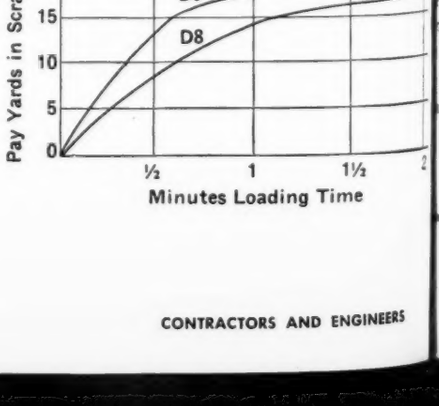
In Belmont, N. C., a D9 and a different competitor were push-loading in sandy clay. The other machine handled 15.3 cu. yd. in .67 min. Or 652 cu. yd. an hour. The D9 handled 17.2 cu. yd. in .42 min. Or 860 cu. yd. an hour. This was a half million cubic yard job; the D9 could have completed it in 3½ weeks less time than the other machine.

On a job in Minot, N. D., on another in Atlanta, Ga., the story was much the same.

Compare a big yellow machine with another big yellow machine

Maybe the best way to spell out how the D9 can boost profits is to compare its performance not with another make but with this famous CAT* D8 Tractor.

Owners and operators know what the D8 will do. Pound for pound, it's the best-producing crawler in its class today. The D9 is bigger, has more power. Does this added size and power really make a difference? Look what happens when you have a D8 and a D9 both pushing DW21-No. 21 units on the same job.



Arnold, assistant-treasurer. Directors are Collis Johnson, Mrs. Collis Johnson, E. H. Hogl, Carl E. Davidson and Ralph B. Stratford.

The firm's sales and service plants are at 2855 N. W. Front Ave. in Portland, and at 1041 Highway 99 N. in Eugene.

Texan dealer for B-L-H

Caprock Machinery Co., 6007 N. E. Eighth Ave., Amarillo, Texas, has been appointed a distributor by the Construction Machinery Division, Baldwin-Lima-Hamilton Corp., Lima, Ohio. Caprock will handle the line of Lima shovels, cranes, draglines, and pull shovels in 14 counties in the central portion of Texas.

Kwik-Mix names dealer

Dakota Supply Co., 415 N. Weber Ave., Sioux Falls, S. Dak., has been appointed a construction and industrial distributor by the Kwik-Mix Co., Port Washington, Wis. The dealer will cover the entire state of South Dakota.

New dealers for Clark

Da-Nite Equipment Co., Route 51 and Samuelson Road, Rockford, Ill., has been appointed a dealer by the Construction Machinery Division, Clark Equipment Co., Benton Harbor, Mich. The distributor will cover 12 counties in the state.

G. H. Godsall Equipment, Ltd., 435 Keating St., Toronto, Ontario, Canada, will carry the line of Michigan earthmoving and industrial material-handling equipment. Godsall Equipment will cover the Province of Ontario, with the exception of the districts of Algoma and Sudbury.

The company extended the sales territory for Bardale Equipment, Inc., 2646 Creve Coeur Drive, St. Louis, Mo., and Emmett C. Watson Co., Inc., 310 S. Brandeis St., Louisville, Ky.

Arrow Contractors Equipment Co., 4646 S. Kedzie Ave., Chicago, Ill., was also appointed as a new dealer for Clark. Arrow Contractors will cover seven Illinois counties and two Indiana counties.

B-S names distributors

The Buffalo-Springfield Roller Co., Division of Koehring Co., Springfield, Ohio, has appointed Cactus Equipment Co., 2310 Calhoun, Houston, Texas, a distributor for Buffalo-Springfield's road rollers and compaction equipment. Cactus Equipment will cover the eastern and southern Texas counties.

McDonald Equipment Co., 115 N. Spring St., Little Rock, Ark., has also been appointed by Buffalo-Springfield. McDonald Equipment will cover the state west of and including Sharp, Independence, Jackson, Woodruff, Monroe, Arkansas, Lincoln, Drew, and Ashley counties.

Indiana dealer appointed by the Bucyrus-Erie Co.

Pit & Quarry Equipment Co., Indianapolis, Ind., has been appointed a Hydrocrane distributor in northern and central Indiana by the Bucyrus-Erie Co., South Milwaukee, Wis. Pit & Quarry Equipment, located at 5851 E. 34th St., is attached to B-E's central sales district.

LeT-WesCo appoints Florida distributor

Adams Construction Equipment Co., 1342 W. Church St., Orlando, Fla., has been appointed a distributor for the complete line of equipment made by the LeTourneau-Westinghouse Co., Peoria, Ill. Adams Construction will cover the entire state, except for ten counties in upper Florida.

The newly formed distributorship is under the management of W. E. Adams, president, and J. A. Vincent, vice president and general manager. Vincent was formerly Eastern sales manager for LeT-WesCo.

Dealer adds to staff

Fred C. Bell has joined State Equipment Co., Kingston, Pa., as the firm's representative in Carbon, Monroe, Pike, and Schuylkill counties. Bell was formerly with an equipment distributor in Camp Hill, Pa.

Four Wheel Drive names

Burg & O'Connor Motors, 16–18 N. Main St., Clintonville, Wis., has been appointed sales, parts, and service dealer for the Four Wheel Drive Auto Co., Clintonville, Wis. Burg & O'Connor will carry Four Wheel Drive's transport carriers, ready-mix and commercial dump trucks in four Wisconsin counties.

...-loads DW21 with No. 470 Scraper on highway job in Wisconsin. ...le job calls for handling 120,960 yards, mostly sandy gravel. D9 ... DW21 in gravel in 70 seconds here, with heaping loads up to 25 yards. Vice President F. L. Carr of L. G. Arnold, Inc., says, "The D9 pusher has more than lived up to our expectations." Grade Superintendent Phil Dudenhoefer adds, "Outproduces by far any other machines on the job."

Forget size, weight, horsepower. Forget toughness and agility. These only point to what counts most: out on the job, how does the D9 really stack up against competition in cost-per-yard?

Or compare these two big yellow machines this ... Say on a job your haul distance averages 1,875 ... and you're using three DW21-No. 21s with one ...her. If that pusher is a D8, you stand to average ... yards an hour. If it's a D9, you'll get 412.

Now, say your spread is made up of the pusher ... the three wheel units, plus a No. 12 Motor Grader ... another crawler with 'dozer and roller. Figure ...r hourly owning and operating cost. Count in the ...reciation, taxes, gas and fuel, lube oil, grease, re... and labor, and operators' wages. If your pusher ... D8, a reasonable figure for the spread would be ...52 an hour. If it's a D9, your costs could come to ...32. But remember, you're getting 344 yards with ... D8, and that comes to 21.4¢ an hour per yard of ... With the D9, you're getting 412 yards at $77.32 ...hour—which figures out at 18.7¢ per yard of dirt.

The D9 would save you 2.7¢ per yard, *and* give ...68 more yards, each and every hour.

Naturally, these figures might not exactly match your own. But they are figures based on actual performance records and they tell an honest story.

Would the D9 make more money for you?

There are jobs that would not warrant a D9. With the rugged D8 available, there may be no need to call in the 29-ton, 320-flywheel-HP D9. But the above figures certainly prove this much: on job after job, the D9 *is* paying its way, no matter how close the records are kept. One of these jobs could be yours.

But don't just take our figures for it. Call your Caterpillar Dealer. Have him demonstrate the D9 on your job. Check it with *your* watch, in *your* dirt, against *your* books. *That'll* tell the tale.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

...el Engines • Tractors • Motor Graders • Earthmoving Equipment

THE D9—
PROFIT BUILDER

For more facts, use Request Card at page 18 and circle No. 210

Trucks buck traffic on long haul for hot-mix paving of service roads

A Ford T-250 dumps hot-mix to the Barber-Greene finisher at a temperature of 275 degrees, after making the 17-mile haul from the batch plant at Kenner. The finisher is putting down the access road in two 10-foot wide passes.

In spite of a 17-mile haul through heavy traffic from the batch plant to the job, blacktop paving went down at a hot temperature and at a good rate of speed during work on service roads of the West Bank Highway near New Orleans. Temperatures of the mix at laydown averaged 275 degrees, and the finisher completed as much as a mile of the 10-foot-wide pavement in a day.

The asphaltic-concrete surface put the finishing touch on a 4.9-mile stretch of highway that parallels the Mississippi across the river from New Orleans. The east end of the project extended to Algiers, where the highway ties into the approach to the Mississippi River Bridge. The western limit was at Barataria Road in Marrero. Contracts are expected to be let this summer to continue the highway west from Marrero to a junction with U. S. 90 at Avondale. Frequent access to the highway is permitted at intersections where traffic is controlled by either stop signs or traffic signals.

The $2 million contract, held by T. L. James & Co., Inc., Ruston, La., included the building of a 4-lane concrete divided highway, bordered on each side by a bituminous service road for the 4.9 miles of the job. The highway section consists of two 24-foot roadways paved with 8 inches of concrete and separated by a depressed median. The 20-foot roadway of the service roads is made up of a 7-inch soil-cement base overlaid with a 2-inch wearing course of bituminous concrete.

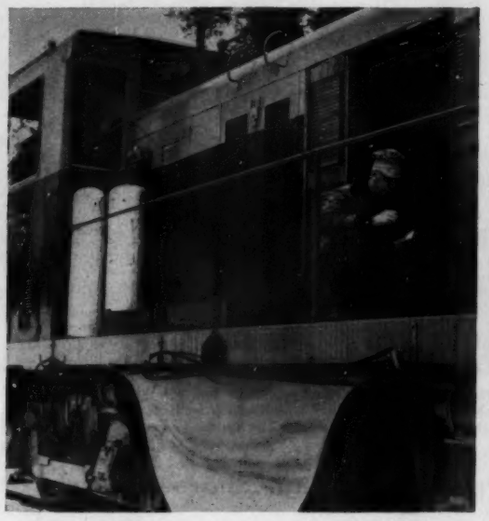
Laydown operation

The surfacing of the 9.8 miles of service roads bordering the highway was one of the last phases of construction. Before the asphalt was laid, a distributor mounted on a Chevrolet truck sprayed a very light coat of emulsified asphalt on the soil-cement base to supplement the emulsified asphalt used for curing the soil-cement.

The distributor sprayed the full width of the 20-foot roadway for a distance of between ¼ and ½ mile ahead of the finisher. The finisher laid one 10-foot-wide, 2-inch-thick mat down one side of the service road, leaving the other side open to traffic. When the finisher returned on the adjoining 10-foot strip, traffic was able to travel on the asphalt laid on the first half of the road. In this way, the 2-inch bituminous surface was completed with two passes of the finisher.

A fleet of dump trucks, hauling from a batch plant in Kenner some 17 miles away, fought heavy traffic to

A single drop of used oil from this truck indicates true condition of the vehicle's oil . . . and tells a lot about the engine's operation.



Daily oil checks assure maximum lubrication efficiency in this diesel locomotive.

Now—they're testing used oil in minutes

THE NEED for a fast, accurate and practical method for determining the condition of used oil has long been one of the more serious problems confronting fleet operators. It's obviously wasteful to discard still-good oil, but operating a vehicle with contaminated oil could lead to costly engine damage. This was an unsolvable condition which maintenance men had come to accept.

Since no two vehicles, even of the same make and model, are identical in performance or operation, maintenance men were compelled to compromise on oil change "averages" recommended by engine manufacturers. This procedure is uncertain and costly. Fortunately, this operating conflict has been resolved with the introduction of a simple but completely reliable oil check system . . . the Shell ADC Oilprint Analysis.

The ADC Analysis was primarily conceived to determine proper oil change intervals for individual engines. However, it goes much further. It is capable of actually reducing engine maintenance costs by disclosing certain mechanical defects *before* they have caused serious engine damage.

The test procedure is very simple . . . requires little practice to perfect . . . and provides a reliable check of oil from merely two drops of used oil. In minutes, the degree of *A*lkalinity, *D*ispersancy and *C*ontamination can be determined easily.

Here are several typical examples from various areas of the country. They show how fleet operators, employing both diesel and gasoline engines, have successfully and profitably applied the ADC program.

A Kansas City Freight Line

Operating a large fleet of trucks, one Kansas City freight line previously had drained and replaced oil every 3,000 miles. After adopting the ADC Oilprint Analysis, individual test charts showed that, in most cases, drainage would not be necessary at less than 6,000-mile intervals. Even at this doubled interval, engine life was not affected. Further proof was established when these engines were inspected at 87,000 miles and no appreciable wear was found on bearings, pistons, rings or valves.

An Idaho Logging Operation

Oil had previously been drained after a limited number of hours of use on an Idaho company's diesel locomo-

◄ As the second 10-foot-wide strip is put down, a Huber 3-wheel, 12-ton roller compacts the joint between the lanes. A shop-built water tank wets the roller.

A Galion 10-ton tandem roller works behind the other, rolling the surface about three times to bring the asphaltic concrete to the required density of 94 per cent. ►

reach the Barber-Greene finisher. The trucks backed up to the front end of the rig and unloaded gradually into the open hopper as they were pushed ahead by the finisher. The mix generally arrived at the job at a temperature of 275 degrees—well above the minimum specification of 250 degrees.

The crew on the Barber-Greene finisher consisted of one operator and a man who adjusted the height of the screed when necessary. Other men on the laydown were two lutemen to work over the edges of the mat and four shovelmen to assist in the unloading and do miscellaneous work. It was not unusual for the crew to lay a mile of 10-foot-wide pavement in a 10-hour day.

Rolling

When the second strip of asphalt was being laid to complete a service road, a Huber 12-ton, 3-wheel unit was used to roll the joint between the two mats for several minutes. The Huber usually worked about half an hour behind the finisher, making about two passes over the surface. Working behind this roller was a Galion 10-ton tandem, which made an average of three passes to bring the asphaltic concrete to the required 94 per cent density.

The bituminous mix for the job was produced by a Madsen Model 111 plant owned by T. L. James. This permanent-type plant dropped 4,000-pound batches in the dump trucks. The mix contained a graded minus ¾-inch aggregate mixed with 5.6 per cent asphalt and 4 per cent mineral filler of limestone dust.

Soil-cement base

Because most of the natural soil was unsuitable for stabilization with cement, dump trucks hauled in a select material from a borrow pit to build up the base for the service roads. After the material had been dumped on the subbase, it was smoothed out by a Caterpillar D6 tractor-dozer and graded to a 7-inch thickness by a Cat No. 12 motor grader.

A Smith cement spreader then covered the surface with enough cement to make a 10 per cent mixture. A P&H soil-stabilizing machine followed to mix and wet the mixture of soil and cement. A Ferguson sheepsfoot roller pulled by a Caterpillar D6 tractor worked over the moist mixture before final compaction was obtained by a wobble-wheel roller. After the soil-cement had set up, a distributor sprayed a light seal coat of emulsified asphalt on the surface.

Personnel

The project is under the supervision of the Marrero District of the Department of Highways. O. D. White is the district engineer. George F. Stevenson is the construction engineer for the district and Reid Day was project engineer.

For T. L. James & Co., Inc., A. B. Aiken was the project manager, Raymond Kennair was superintendent in charge of soil-cement operations, and G. S. Triplett was asphalt superintendent. Griffin Nugent and E. L. Saint were concrete superintendents.

THE END

Substantial oil economy is realized in this tractor, because oil is changed only when indicated by the Oilprint.

Taking a quick "fingerprint" of crankcase oil from an interstate carrier.

tives. With the ADC Oilprint Analysis as a guide, the oil-change interval has now been safely increased many-fold. The savings made possible by this on-the-spot test in oil, filter change and labor costs were considerable. Furthermore, leaky head gaskets are frequently discovered before any serious engine trouble develops. Here is another valuable plus for the ADC Oilprint Analysis.

A Washington, D.C., Transit Company

This transit company operates a large fleet of buses with both gasoline and diesel engines in use. With the difference in operating schedules . . . rush hours, short and long hauls, around-the-clock schedules . . . both engine types were believed to require complete oil changes every 2,000 miles. When the ADC program was instituted, the tests showed that oil-drain periods and minor maintenance checks could be safely extended to every 3,000 miles for gasoline engines and 4,000 miles for diesel engines.

Fleet operators, who are concerned with extending the service of crankcase oil and avoiding the risk of using contaminated oil, are invited to sit in while a Shell service engineer demonstrates the time-and-money advantages of an ADC Oilprint Analysis program.

Photo shows an oil-spot test card . . . one phase in the visual life record of a change of oil.

One drop of a special indicator* fluid developed by Shell checks the alkaline reserve in the oil.

*Indicator Fluid U.S. Patent No. 2,770,530

SHELL OIL COMPANY

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SHELL

For more facts, use Request Card at page 18 and circle No. 211

Structures and heavy traffic limit room on expressway job

Men check the footing of the twin-box culvert as a concrete bucket is lowered. The culvert, which will regulate the flow of Black Creek at the Brentwood Boulevard interchange, has three footings to support the two outside walls and common inside wall.

It was often a temptation for a dragline operator to drop a bucketful of dirt on a passing convertible—and sometimes almost a necessity—since heavy traffic and cramped working conditions added to the difficulties of building a mile-long section of the Daniel Boone Expressway connecting with Highway 40 (TRK) just west of St. Louis, Mo.

In order that traffic could be detoured, the 1,200-foot-long, double-barreled box culvert that arched through the busy intersection at Brentwood Boulevard had to be constructed in sections. Because of lack of space, material excavated from the big box culvert had to be hauled away by trucks to a stockpile and later hauled back to be used in the fill.

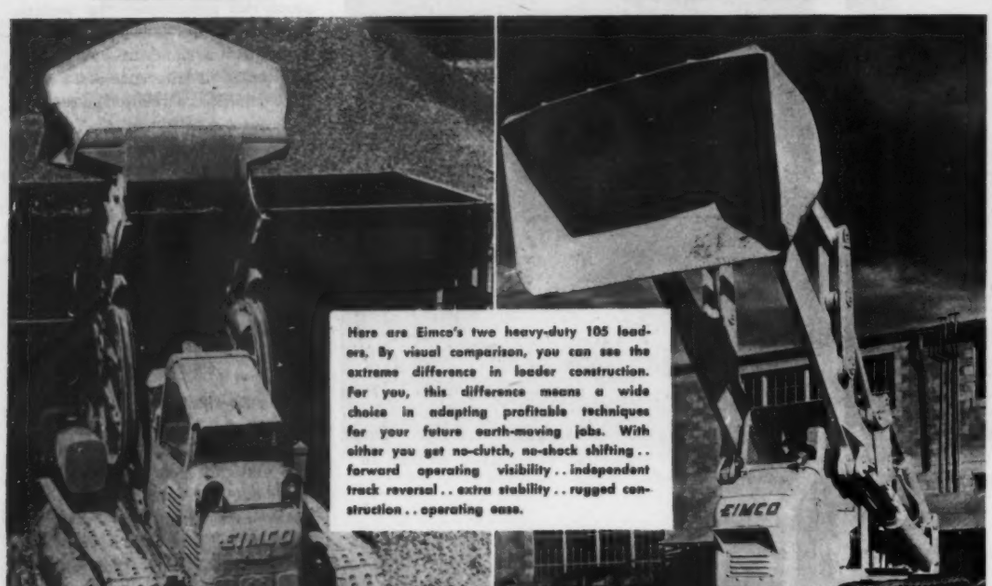
Fruin-Colnon Contracting Co., Inc., St. Louis, expects to finish work on the $2¼ million contract by November. It includes grading about a mile of the 6-lane divided highway and constructing four major structures—a 1,200-foot-long, twin-box culvert to regulate the flow of Black Creek at the Brentwood interchange; a cloverleaf interchange at Brentwood Boulevard; a bridge spanning the Terminal Railroad between Brentwood Boulevard and Hanley Road; and an overpass on Hanley Road for the Daniel Boone Expressway. It also calls for widening Highway 40 (TRK) for ½ mile to make a west approach to the interchange.

Build big box culvert

One of the first steps on the project involved excavating for the 1,200-foot-long twin-box culvert that crosses under Brentwood interchange on a curving line from the northwest corner to the southeast corner. Although some of the excavation was handled by scrapers, the greater portion of the 7,180 cubic yards of earth was moved by three cranes with draglines. The Bucyrus-Erie 51-B, Manitowoc 2000, and Manitowoc 1600 cranes unloaded at least one-half of the earth into dump trucks that hauled it away to a stockpile to be re-used later for fill material. The excavation for the box culvert was about 46 feet 6 inches wide and about 12 feet deep, with three small trenches in the bottom to contain the footings for the reinforced-concrete walls of the culvert.

The separate parts of the culvert were constructed in five steps. First, three reinforced-concrete footings were formed and poured to support the two outside walls and common inside wall of the culvert. Second,

ONLY EIMCO ... OFFERS YOU THIS LOADER SELECTION



Here are Eimco's two heavy-duty 105 loaders. By visual comparison, you can see the extreme difference in loader construction. For you, this difference means a wide choice in adapting profitable techniques for your future earth-moving jobs. With either you get no-clutch, no-shock shifting .. forward operating visibility .. independent track reversal .. extra stability .. rugged construction .. operating ease.

EIMCO 105 EXCAVATOR

EIMCO 105 FRONT-END LOADER

THE 1½ YARD EIMCO EXCAVATING LOADER can dig and load rock and other tough materials on a comparable basis with boom-type equipment many times more costly. The bucket travels overhead to discharge, providing an operating cycle of 10 to 12 seconds. With 39,000 lb. digging force and "high leverage" rocker arm contour, it digs fast .. even in tough clay, hardpan, shale, glacial till, etc.

The Eimco 105 Excavator is especially adapted to all types of tunnel excavating .. loading blasted rock or overburden on narrow benches .. removing material on highway projects without blocking the motorist by-pass lane .. and many other applications where ability to load without turning is convenient and saves time. Spot trucks close behind and your Eimco 105 operator will keep haulage equipment working at a maximum pace every hour.

Write for Bulletin L-1048 today!

THE 2½ YARD EIMCO FRONT-END LOADER with 40,000 lb. break-out is an extremely flexible heavy-duty loader — ideal for digging off high banks .. handling fine, dusty or wet material .. dicharging into any size trucks spotted on a higher elevation .. cutting smooth grades where strong downward pressure is needed .. razing .. bulk loading .. and many other applications. Dozer blades, fork lifts and other attachments are readily fitted to this loader. It operates in 9' 6" headroom .. can reach over a 14' bin, hopper or gondola to discharge its cargo.

The loader mechanism operates at high mechanical efficiency and has many exclusive hydraulic system protective features. Combine this with extreme 105 tractor mobility and you get an earthmover that will make more trips every hour .. stay on the job longer .. get greater total production than competitive front-end units.

Write for Bulletin L-1050 today!

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EIMCO

5-282

For more facts, use Request Card at page 18 and circle No. 212

Concrete and grading crews keep work moving on mile-long contract that calls for big twin-box culvert, interchange, bridge, overpass

Two Bucyrus-Erie cranes place forms for the curved section of the twin-box culvert. The walls, averaging about 14 feet high, were formed with ¾-inch plywood backed by 4×4 studs and double 2×6 wales.

guys were attached to the outside footings to support the inside wall form before the common inside wall was formed. Third, the inside wall was used to guy the bracing, the two outside walls were formed and poured and the concrete floor, in both left and right sections of the culvert, was placed. Lastly, the two arched roof sections were formed and poured.

The contractor formed the walls, which average about 14 feet high, by using ¾-inch plywood backed by 4×4 studs and double 2×6 wales. The forms and reinforcing steel, prefabricated in 30-foot lengths, were set with Bucyrus-Erie cranes. Walls were poured in 60-foot sections. The plywood forms for the arched roof of the 11×20-foot single box of the culvert were interesting in design.

Jacks, resting on the concrete floor, supported 6×6 posts which rose to a 12-inch I-beam. The I-beam, spanning the 20-foot-wide culvert, carried vertical posts to 4×8 segments that were cut to fit the arc of the roof. The arched segment supported 2×6's that ran parallel to the centerline of the culvert and formed the backing for the ¾-inch plywood.

An ingenious aspect of the form was the 6×6 posts that were hinged to the I-beam. When the forms were being stripped, this arrangement allowed the posts or legs to fold inward so that the form could be lowered on a cart equipped with jacks and wheeled to the next position. Each form was 8 feet long and 20 feet wide, and there were enough forms to make three 60-foot sections.

The 7,000 cubic yards of concrete, supplied by Material Service Co., St. Louis, in transit-mix trucks, was bucketed to the forms by a Bucyrus-Erie 38-B crane. Both Master and

(*Continued on next page*)

A bucket of ready-mix concrete is dumped to the floor of the culvert. Workmen float-finish the concrete, while Hunt Process concrete-curing compound is sprayed onto the slab, background.

HOLD EVERYTHING!

BIG NEW SERIES E TRAXCAVATORS*

NOW AVAILABLE

For the extra-rough jobs

The tough reliability of the No. 955 and No. 977 has already been field-proved. In the new Series E, these Cat-built Traxcavators give even greater performance in applications that put top stress on the guts of your equipment.

These CAT* Series E Traxcavators come equipped with a new heavy-duty, extra-sturdy undercarriage for longer life, lower maintenance costs, and better job production when the going is really bad.

You get—

New heavier idlers
New solid sprockets
New and tougher track rollers with frames and guard of heavier construction
More ground clearance
Lower center of gravity for better handling and more stability
Lower transmission speeds for more bucking power

No change in the maneuverability, big capacity and always dependable power of these great machines, of course.

For all the details on this improved Traxcavator line, phone your Caterpillar Dealer—same man you call for expert service and replacement parts that don't let you down.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.

OUR GOAL: To concentrate our capabilities, resources and experience on the design, manufacture, distribution and service of job-tested heavy equipment.

For more facts, use Request Card at page 18 and circle No. 213

A Bucyrus-Erie 51-B crane clams out the bottom of the culvert to prepare for the pouring of the floor. In the background, another crane lowers a bucket of concrete to the culvert pour.

Leveling the area at the Brentwood Boulevard interchange are a Caterpillar DW15 scraper, a Cat D8 dozer, right, and a Cat D7 with sheepsfoot roller, background.

(Continued from preceding page)

Maginniss electric vibrators consolidated the mix. The floor slab of the culvert was float-finished and Hunt Process concrete-curing compound was applied to the fresh concrete by a Hudson sprayer. The 450 tons of reinforcing steel, set in prefabricated 30-foot sections by a crane, was furnished by Laclede Steel Co., St. Louis.

When the huge box culvert had been completed, work began on the reinforced-concrete, box-girder-type bridge that carries two 38-foot divided roadways over Brentwood Boulevard. The 210-foot, 3-span deck is supported by two reinforced piers set on bedrock. Four cloverleaf ramps, about 16 feet wide, will provide access to and from the bridge.

Bridge over terminal railroad

About a quarter of a mile east of the Brentwood interchange, the contractor was faced with the problem of building a reinforced-concrete bridge over the Terminal Railroad while leaving the tracks open to traffic. The bridge, of T-beam monolithic-type construction, was built in two sections: one consists of a 38-foot roadway for west-bound traffic; the other consists of a 38-foot roadway for east-bound traffic. Each bridge has spans of 48, 64, and 48 feet.

The Armco heavy-walled steel pile shells supporting the abutments were driven about 40 feet deep by a Vulcan No. 1 hammer assisted by a Bucyrus-Erie 38-B crane. A Cleaver-Brooks 80-hp boiler supplied the steam for the hammer. Wood piles were also driven on the slope going down to the tracks to support scaffolding later used in forming the deck. Six of the 48-inch-diameter reinforced-concrete columns were founded on rock and two were set on steel H-beam piles.

Bridge deck work

The form work of the center span was carried over the tracks by 12-inch I-beams supported by double-deck towers of Beaver Advance scaffolding. The scaffolding for the shorter spans above the side slopes rested on a grillage of I-beams supported by the tops of wood piles. The T-beam section of the forms rested on 4×8 main carriers on the scaffold. Rising up from the main carriers were 4×4 posts, at 2-foot centers, which carried the 2×10 joists supporting the beam bottom. Forming

New specialized off-highway V-8

Another reason why you'll find International Trucks cost least to own!

A new six-wheeler designed exclusively by INTERNATIONAL for heavy-duty off-highway work—with the most powerful truck-type engine in any comparable truck. Tough, husky construction to perform profitably under the most rugged conditions!

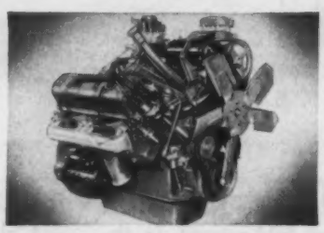
Here is more evidence of the INTERNATIONAL policy to build the trucks that operators want and need . . . trucks with only the highest quality components, the biggest selection of components to stay on the job longer at *least* cost. And INTERNATIONAL Trucks do cost *least* to own—fleet owners' cost records prove* this.

Why not get proof yourself? See or call your INTERNATIONAL Dealer for all the facts. Do it today.

**Signed statements in our files, from fleet owners throughout the U.S., back up this statement.*

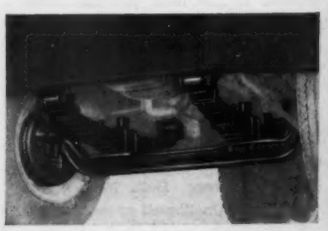
INTERNATIONAL HARVESTER COMPANY, CHICAGO

Motor Trucks • Crawler Tractors
Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors



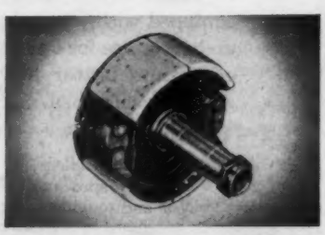
1 Most V-8 power in any truck, 257 hp. New Heavy-duty VF-230 models have load-moving ability unlimited, power to haul the biggest loads. Other six-wheeler engines include sixes and new V-8's—gasoline, LPG and diesels up to 356 hp.

2 INTERNATIONAL tandems give longer, more dependable life. This heavy-duty, double reduction unit has 50,000 lbs. capacity. Sturdy cast steel housings. Third differential with lock transmits power smoothly and evenly to each axle.

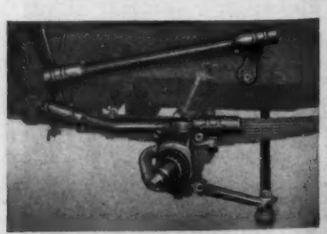


3 Balanced heavy-duty front end for maximum loading, added stability and longer life. 15,000 lbs. capacity heat-treated high carbon steel axle, 4-inch wide springs, threaded pins and bushings. Built to take the big jobs in stride.

4 INTERNATIONAL steel-flex frames combine great strength with proper flexibility. New models have deep, double channels made of heat-treated alloy steel. Reinforced cross-members with husky gussets for sturdy, lasting tandem suspension.



5 Efficient, fast-acting air brakes are standard on Heavy-duty VF-230—17½ in. x 3 in. front, 16½ in. x 7 in. rear with 1,162 sq. in. total lining area. Other six-wheel models with brake types and sizes to match load and operation *exactly*.



6 True geometric steering provides easier handling and outstanding maneuverability. Heavy-duty gears are cam and roller-mounted twin lever type. Controls mounted *ahead* of the front axle. Power steering standard on this new model.

A Caterpillar DW21 scraper hauls away part of the 175,000 cubic yards of excavation for the Hanley Road overpass. The greater part of the dirt at the overpass was used to build up the area of the Brentwood interchange, a mile away.

the bottom of the arched beam were sections of ¾-inch plywood backed by two 2×8's resting flatwise. Sides of the beam were of ¾-inch plywood backed by 2×4 studs with double 2×4 wales. Richmond Snap-Ty connections were used in the forming.

A power line above the bridge presented a problem in concrete placing. As the Bucyrus-Erie crane could not work under the power line, a belt conveyor about 40 feet long carried the concrete to those parts of the deck the crane could not reach. The concrete, delivered to one end of the conveyor, was struck off the belt with steel arms whenever necessary.

A specially designed vibrating screed, spanning the 38-foot-wide deck, struck off and consolidated the concrete. The screed, which traveled by means of an electric motor, rested on 4×4 screed bars set in Richmond supports. These adjustable screed bar chairs, specially built to handle the big screed, consisted of a U-shaped bracket that screwed into a turnbuckle-like center member. A bolt, screwed into the lower end of the turnbuckle, passed through the plywood decking and was held in place by a wing nut.

After the concrete had been struck off by the vibrating screed it was given a longitudinal finish and belted before a broom finish was applied.

A workman inserts removable screed bar supports into a hole in the deck forms of the bridge crossing the Terminal Railroad. These specially built adjustable Richmond supports hold 4×4 screed bars.

As soon as the concrete had set up sufficiently, jute curing mats were laid on the deck.

Hanley Road overpass

After a detour had been built and the 175,000 cubic yards of excavation moved, construction started on the 220-foot-long reinforced-concrete bridge that carries Hanley Road traffic over the expressway. The box-type girder bridge contains two 24-foot roadways with a 5-foot walkway for each lane. A 127-foot clear span for the roadway is flanked by spans of 33.5 feet. The bridge rests on two abutments and two solid wall reinforced-concrete piers. Cloverleaf-type ramps will be installed.

The greater part of the earth at the Hanley Road overpass cut was used to build up the area of the Brentwood Interchange. To handle the mile-long haul, the contractor used a fleet of three Caterpillar DW15's, one DW21, and four Euclid 8TDT scrapers push-loaded by a Caterpillar D8 and Allis-Chalmers HD-21 dozers. The fill was compacted with sheepsfoot rollers pulled by D7 tractors. Other earthmoving equipment included a Cat D7 dozer, two Cat No. 12 motor graders, and a Caterpillar 955 Traxcavator.

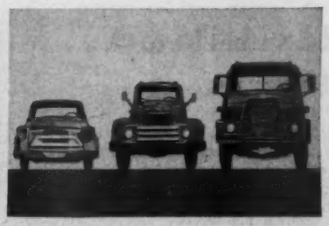
Fruin-Colnon Contracting Co., Inc., has as project manager John P. Berra. The project engineer is Cay G. Weinel, Jr., and superintendents in charge of separate phases of the construction are Percy K. DeRousse, Willard DeRousse, Lowell Emert, and Gerald Englund. R. A. Currie is district engineer for the Missouri State Highway Department, Ralph Day is district construction engineer, and Benjamin B. Bondurant and R. H. Mendell are assistant engineers.

THE END

Latest addition to the world's most popular line of six-wheel trucks—new INTERNATIONAL Heavy-duty VF-230 with 60,000 lbs. GVW. Built to absorb severe shock loads, to stand up under the most extreme applications. Engine is the industry's most powerful V-8, *257 hp.* Other new off-highway V-8 six-wheelers available, plus models from 22,000 to 76,800 lbs. GVW in conventional and COE design. Complete selection of all-wheel-drive models, too.

7 Heavy-duty, functional construction. Fenders are 12 gauge diamond tread steel plate, welded and reinforced for extra strength and long life. Massive, sturdy bumpers and guards. Rugged reinforced support for front tow pin.

8 INTERNATIONAL also offers a complete line of all-wheel drive models for the tough, off-highway operations. Completely factory-built, 7,000 to 43,000 lbs. GVW. Low height with ample ground clearance. Complete selection of equipment available.



9 World's most complete line. There is an INTERNATIONAL "tailor-made" for *every* job, half-tonners to 96,000 pounders. Choice of 4-wheel, 6-wheel and all-wheel-drive models, conventional and COE design. Every one built to cost *least* to own!

For more facts, use Request Card at page 18 and circle No. 214

Two Caterpillar D8 push tractors team up to speed the loading of a Caterpillar DW21 scraper.

New highway alignment eliminates grade crossings

Under two separate grading contracts, contractors built an 18-mile section of a new alignment for U. S. 30, located in west-central Iowa. Although the new alignment crosses some of the typically flat rich farm land "where the tall corn grows", more than 1.5 million cubic yards of earth, much of it in the overhaul classification, had to be removed.

The westerly contract section was between Scranton and Jefferson, while the easterly section started at Jefferson and swung around the north side of Grand Junction to meet the old alignment east of the city. In addition to bypassing the business areas of Jefferson and Grand Junction, the new alignment eliminated two dangerous railroad grade crossings.

Grading work

The contractor for the easterly $176,000 job was Ira Van Buskirk & Sons, Hawarden, Iowa, which did the work jointly with H. F. Schroeder & Sons, Carroll, Iowa. Wilbur Nielson, Blencoe, Iowa, was the contractor on the westerly section.

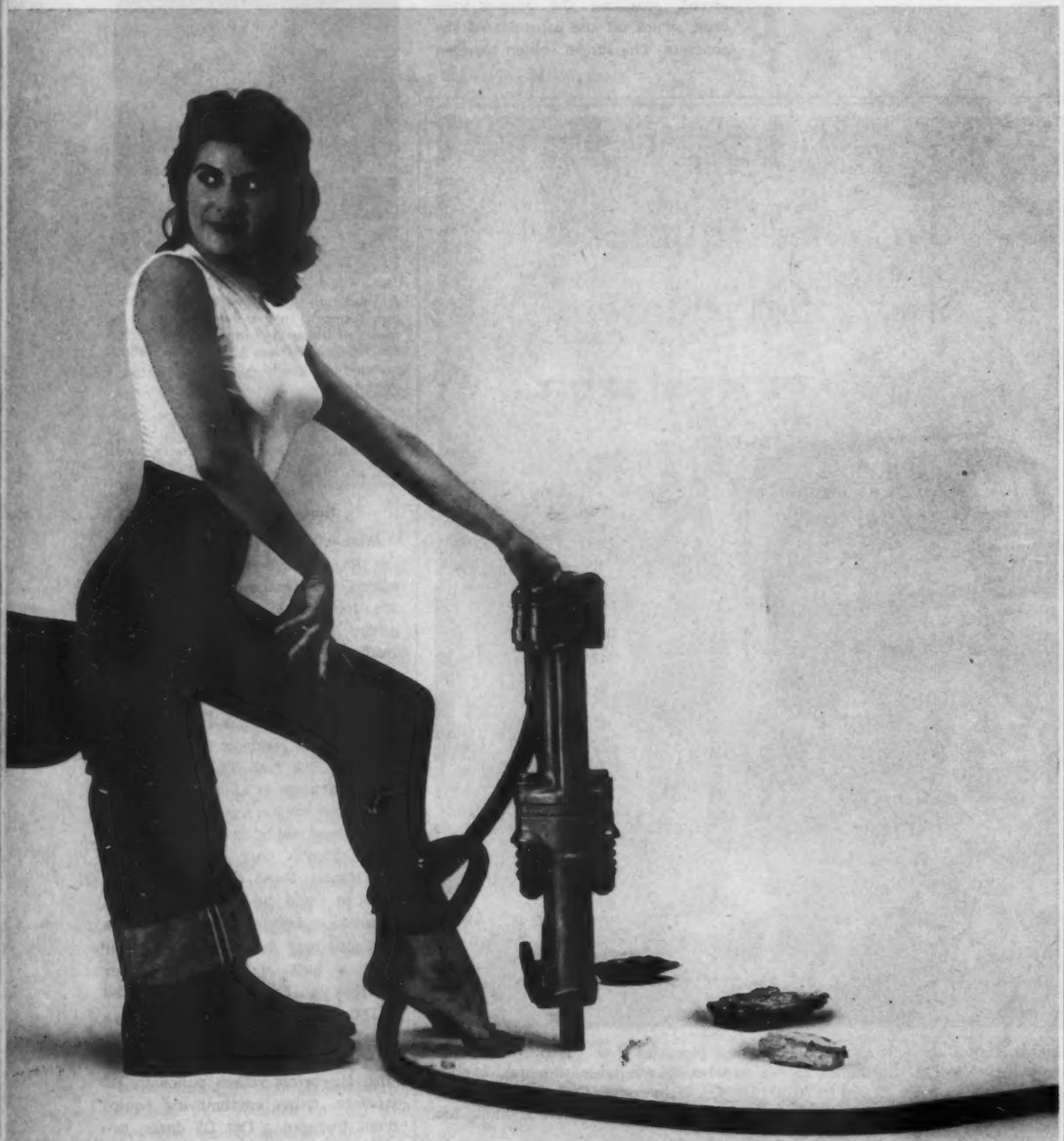
The grading section on this project had a 48-foot top with 3 to 1 shoulder slopes leading to a 10-foot-wide flat ditch. Backslopes were 2½ to 1. A lift of granular base and concrete paving was built under a separate contract to complete the highway.

Of the 828,000 cubic yards of earthwork in the easterly contract, a substantial portion was borrow and overhaul which went into a 38-foot-high fill approaching a railroad grade separation near the east end of the project. A spread of rubber-tire scrapers handled most of this long-haul material, while another spread of crawler tractors and scrapers did the cut-and-fill where the hauls were short.

Get new push tractor

A new Caterpillar D9 push tractor, delivered to Schroeder's spread during the early stages of the earthwork, was quickly put to work. On hand to see the new giant delivered was H. F. Schroeder, founder of the company, who started grading back in 1921 with horses and scrapers. Schroeder has seen earthmoving equipment evolve from the horse-drawn rigs to today's giant machines. He actively managed the company that bears his name until about a year ago, when his two sons, Virgil and Elmer, took over.

In the spread which the D9 joined



Surfaces lap-finished...

in the Le Roi Model C11 Breaker

Lap-finishing means the honing of surfaces to precision tolerances. For example, lap-finishing of the main piston bore after grinding increases breaker efficiency. This type of honing provides a better retaining surface for costly lubricant. Also, honing off the "high" spots cuts air consumption. This precise mating of parts is one reason why the C11 breaker outperforms and outlasts other makes.

But the C11 will sit well with you for reasons other than lap-finishing. For instance, air cushions above and below the hammer make the C11 an exceptionally easy breaker to hold. An oil regulator in the handle provides correct lubrication for all moving parts. Another long-life feature is the four-bolt construction that secures the handle. Investigate these and other C11 refinements today. See it, try it at your Le Roi distributor. Or write the Le Roi Division, Westinghouse Air Brake Company, Milwaukee 1, Wisconsin.

LE ROI NEWMATIC AIR TOOLS

PORTABLE AND TRACTAIR® AIR COMPRESSORS • STATIONARY AIR COMPRESSORS • AIR TOOLS

←For more facts, circle No. 215

Tractor-scraper fleet moves 1.5 million yards of earth to grade 48-foot-wide base with 3 to 1 shoulder slopes

On a ditch cut, a Cat D8 pushes another D8 tractor in combination with a Cat 80 scraper. These rigs also worked on short hauls and did finishing.

were four Caterpillar DW21 scrapers, a Caterpillar DW10 scraper, a D8 torque-converter push-tractor, a D7 pulling a LeTourneau-Westinghouse double-drum sheepsfoot roller, and a pair of Caterpillar No. 12 motor graders handling the haul roads and finishing operations.

The tractor-scraper spread, which handled most of the shorter hauls, included three Caterpillar D8 tractors with Cat 80 scrapers, a D8 push-tractor, a D6 tractor pulling a double-drum LeTourneau-Westinghouse sheepsfoot roller, and a Caterpillar No. 12 motor grader doing the finishing.

Personnel

Virgil and Elmer Schroeder, partners in H. F. Schroeder & Sons, supervised the work. The foreman of the scraper spread was Rasmus Nielsen and the foreman of the rubber-tire spread was John Hoogestraat. The resident engineer for the Iowa State Highway Commission was DeRuth Stonemeyer. The construction engineer for the Highway Commission is C. L. Gleason.

THE END

ASME appoints two assistant secretaries

The American Society of Mechanical Engineers has appointed William E. Reaser and John D. Wilding assistant secretaries. Reaser, formerly a professor of engineering at Princeton University, will be responsible for the society's membership relations in the United States, Mexico, Canada, and Hawaii. An important phase of these activities is the work with students and recent mechanical engineering graduates of American colleges and universities.

Wilding, a member of the ASME staff since 1954, will be in charge of the society's Codes and Standards Service, which coordinates the activities of more than 75 committees.

Buttenheim-Dix officer dies of heart attack

Edwin Wagner, 59-year old secretary and treasurer of the Buttenheim-Dix Publishing Corp., died late last month of a heart attack. A member of the company since 1919, Wagner held such positions as assistant treasurer, purchasing agent, and space salesman.

He is survived by his wife, Florence; two sons, Edwin, Jr., and Roy; and two grandchildren.

AVAILABLE NOW! Granco Steel Products Company, leading building-products manufacturer in the Midwest, introduces new deep-beam Guard Rail for highways and bridges—available through distributors in principal cities.

HI-STRENGTH VISUAL BARRIER. Tough carbon steel. Corrugated shape. Acts as a continuous impact-resistant beam. Highways—12-gage; bridges—10-gage. Force of collision is absorbed by posts on *both* sides of the impact. Highly visible, reflects light day and night.

GREATER SAFETY. Granco Guard Rail reduces highway hazards, minimizes serious accidents and road "hogging," inspires driver confidence, channels out-of-control vehicles back onto road with least damage, lessens danger to other cars.

NO POCKETING! Guard Rail deflects cars *parallel* to roadway, can't trap them in a collapsing pocket (see drawing).

Beam strength and height prevent cars from hurtling over or going under rail. Flared end sections help prevent cars from hitting the end of a rail head on.

INTERCHANGEABLE SECTIONS. Standardized units have been adopted by American Association of State Highway Officials. Damaged sections do not impair efficiency of undamaged sections, may be rolled out and re-used.

ECONOMICAL. Sections nest conveniently for compact shipment, are easy to handle and install. Accessories are furnished with rail. Granco Guard Rail is painted with a rust-inhibitive primer, uniformly applied by "flow coating" and then baked to a hard-enamel finish.

IDEAL FOR BRIDGES. Granco Guard Rail provides a safe approach, permits maximum use of roadway, reduces center-line crowding, protects trusses.

NEW PRODUCT MANUAL! Contains eight pages of application photographs, standard drawings, specifications, curving data, installation instructions and facts on non-highway use. WRITE FOR YOUR FREE COPY TODAY. Attn.: Dept. CO-71.

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For more facts, use Request Card at page 18 and circle No. 216

A workman uses a Chicago Pneumatic impact wrench to tighten the Russell, Burdsall & Ward high-tensile bolts for a girder connection. The bolts are used to make beam connections for all sections over 12 inches.

Light steel lifts, bolting keep production high on bakery

One crane handles 50 tons of structural steel per 8-hour day; 407 displacement caisson piles support 6,300 tons of steel

Structural steel, placed at a rate of 50 tons per 8-hour day with only one crane, is rapidly bringing to the finish mark the new National Biscuit Co. bakery in Fairlawn, N. J. The multimillion-dollar facility requires 6,300 tons of steel, which is being furnished by the Ingalls Iron Works Co., Verona, Pa., subcontractors on the project.

Erected on a 40-acre site, the bakery is about 1,200 feet long and 400 feet wide and will provide approximately 500,000 square feet of floor space. The structure, varying from one to eight stories high, was designed by Nabisco engineers and is being built by Walter Kidde Constructors, Inc., New York, N. Y. The highest part of the bakery is a 160-foot-high tower section, which will house huge bins for storing raw materials. The materials will be delivered on an Erie Railroad spur built into the building. Bakery operations will begin at this end of the building and proceed in a straight line to the packaging department and shipping room at the far end. This, too, will have a rail spur.

Steel erection

All the steel, shipped to the site by trailer truck, was erected by Lehigh Construction Co. under an agreement with Ingalls Iron Works. Lehigh used about 110,000 Russell, Burdsall & Ward high-tensile bolts to make beam connections for all sections over 12 inches. Machine bolts were used to connect shallow beams. Chicago Pneumatic impact wrenches, powered by Ingersoll-Rand 315-cfm Gyro-Flo air compressors, tightened the ¾, ⅞, and 1-inch-diameter bolts.

Along the length of the plant there are 35 rows of columns spaced on about 50-foot centers. There are 25 rows of columns across the width of the building, with spans of 25 to 40 feet. During steel erection, Lehigh used a Manitowoc 3000 crane with a 95-foot boom and 30-foot jib. In order to place steel for the tower, the subcontractor replaced the 95-foot boom with a 125-foot boom. The heaviest lift was a 5-ton, 52-foot section.

Piles support tower

The 407 Franki displacement caisson piles reached sufficient bearing in the sandy granular material to support the eleven rows of steel columns for the tower. The caisson piles, installed by the Franki Foundation Co., New York, N. Y., were first intro-

FULLER ROADRANGER® Transmission standard in new LeT-WesCo truck

Fuller's 9-speed R-1150 ROADRANGER Transmission was selected for the revolutionary new 30-ton LeTourneau-Westinghouse off-road hauler ". . . because of the wide range of gear selection and speeds, plus the fact that it shifts easily and quickly."

Merle R. Yontz, President, says: "We wanted a tough, fast, high-production hauler which would be cheaper to run, simpler to maintain, and easier to operate—one that would make more money per trip for its owners."

So, the LW-30 features the new Fuller R-1150 ROADRANGER Transmission, designed specifically for extremely heavy-duty off-highway service. Advantages:

- No gear splitting—9 selective gear ratios are evenly and progressively spaced
- Pre-selective countershaft brake for easier, quicker shifts
- Average 38% between ratios
- One shift lever controls all 9 forward and 2 reverse speeds
- Engines operate in peak hp range with greater fuel economy
- Less driver fatigue—1/3 less shifting than with comparable multi-speed transmissions
- Range shifts pre-selected—automatic and synchronized

Check with your local truck dealer for the *right* Fuller Transmission for your job.

New LeT-WesCo LW-30 truck, powered by 375 hp Cummins 4-cycle, turbo-charged, V-8 engine, features Fuller 9-speed R-1150 ROADRANGER Transmission.

FULLER MANUFACTURING COMPANY, Transmission Division, Kalamazoo, Michigan • Unit Drop Forge Division, Milwaukee 1, Wisconsin • Stuler Axle Company, Louisville, Kentucky (Subsidiary) • Sales & Service, All Products, Western District Branch, Oakland 6, California and Southwest District Office, Tulsa 3, Oklahoma.

For more facts, use Request Card at page 18 and circle No. 217

A Manitowoc 3000 crane, equipped with a 95-foot boom and 30-foot jib, positions a steel section for the Nabisco bakery. Steel for the building was supplied by the Ingalls Iron Works Co., Verona, Pa.

duced in Belgium over 40 years ago, but they are relatively new in the United States.

A heavy, 20-inch-diameter steel tube with 1¾-inch-thick walls was set in the 40-foot leads of the Franki machine. Inside the casing was a 13-inch-diameter ram weighing 7,000 pounds that could be raised and dropped. The Franki rig, powered by a GMC diesel, positioned the casing at the desired pile location. Then a 5-cubic-foot batch of zero slump concrete was dropped to the bottom of the tube and tamped with the ram until the arch action caused the dry 1:2:4 mix to seize the side of the casing. Once friction developed, the ram was dropped from greater heights to strike the concrete plug. As it was forced into the ground, the plug pulled the casing down.

When the casing had reached a predetermined depth of 30 or 40 feet, it was raised slightly by the heavy tackle on the leads, and the concrete plug was knocked loose, so that it slipped clear of the casing. Small batches of dry concrete, with less than four gallons of water per bag of cement, were dropped into the tube through the annular space between the ram and casing. These charges were rammed into the soil surrounding the bottom of the casing until it took 20 blows to ram the last 5-cubic-foot batch of concrete out of the casing. Each blow of the ram, developing 140,000 foot-pounds of energy, was determined by the drop distance of the ram. If, for example, the 7,000-pound ram is dropped 30 feet down the tube, more than 200,000 foot-pounds of energy is developed.

After the expanded bulbous base was formed, small charges were rammed out repeatedly with at least two 30,000-foot-pound blows. The casing was slowly withdrawn by the hoisting attachment of the rig. These successive charges, rammed against the already-compacted upper earth around the casing, formed a dense and highly compacted 2-foot-diameter concrete shaft.

The concrete, supplied by a Kwik-Mix ½-yard mixer, was transferred by a front-end loader to the skip on the Franki rig. The skip can be raised the length of the leads to load the concrete into the casing. Each of the 407 caisson piles for this project, installed during an 8-week period, developed a minimum bearing of 120

(*Continued on next page*)

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Sun, fumes, heat, moisture, weathering, and road grime take a costly toll! BUT—you can Stop Rust and match your original equipment colors with Rust-Oleum! No need to remove all the present rust—just scrape and wirebrush to remove rust scale and loose rust—then apply Rust-Oleum H-50 Primer or 769 Damp-Proof Primer directly over the sound rusted surface! To match original colors, follow-up with your desired Rust-Oleum finish color!

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- ☐ H-23 M-H Straw Yellow
- ☐ H-25 New Idea Orange
- ☐ H-3 J. D. Green
- ☐ H-10 J. D. Yellow
- ☐ H-11 J. D. Red
- ☐ H-4 Caterpillar Yellow
- ☐ H-5 Black
- ☐ H-9 Euclid Green
- ☐ H-26 New Idea Green
- ☐ H-13 Oliver Red
- ☐ H-14 Oliver Orange
- ☐ H-22 Oliver Yellow
- ☐ H-12 Oliver Green
- ☐ H-1 Allis-Chalmers Orange
- ☐ H-7 Ferguson Gray
- ☐ H-27 Light Euclid Green
- ☐ H-18 Massey-Harris Yellow
- ☐ H-19 Massey-Harris Red
- ☐ H-16 New M-M Prairie Gold
- ☐ H-17 M-M Red
- ☐ H-20 Ford Gray
- ☐ H-21 Ford Red

For more facts, use coupon, or Request Card at page 18 and circle No. 218

(Continued from preceding page)

tons. The bearing capacity of this type of cast-in-place pile is derived mainly from its enlarged bulbous base, which takes advantage of the carrying capacity of the highly compacted soil around the base. Skin friction along the shaft also aids the bearing qualities of the caisson, because of the rough exterior formed by ramming the concrete out of the casing and against the soil.

Clusters of these caisson piles were capped to form footings for the various column sections. The largest footing, 9 feet 8 inches×16 feet 8 inches, was 5 feet 10 inches thick. This cap was poured over the eight caisson piles which support a 16×18-inch column in the storage tower. The number of caissons per cap varied from 2 to 9, as did the size of caps. Most of the caps supported a 5-foot-square pedestal, varying in thickness, to bring the column base up to design grade. The remaining building columns were supported on spread footings that ranged from 6 to 15 feet square and 3 to 6 feet thick.

Building interior

The roof of the building will be constructed with precast-concrete planks spanning the steel framework, and will be topped with a 1-inch insulation of 4-ply felt covering. Natco tile will be used as the exterior facing material of the building, and the tower will have an extruded aluminum and porcelain enamel covering.

The Franki Foundation Co. rig, powered by a GMC diesel, installed 407 displacement caissons for the plant foundation. The skip in front of the rig can be raised for charging concrete into the casing.

Three Otis electrically operated elevators will be housed in the tower, and two hydraulically operated ones will be used in the main building.

Two fuel oil storage tanks, each having a 100,000-gallon capacity, were buried in a single unit near the building to supply fuel oil to the high-pressure steam plant of the new bakery. These 15-foot-diameter, 72-foot-long tanks were delivered to the plant site by trailer trucks.

The new plant will provide a floor area of about 500,000 square feet when it is completed at the end of this year. When it reaches full production, the plant will employ about 2,400 persons.

Personnel

Warren N. Trusdell is the resident engineer for the National Biscuit Co., and Mike Tonnesen is the superintendent for Walter Kidde Constructors.

THE END

M-C&S builds facilities adjacent to Glen Canyon

Headquarters and plant facilities of Merritt-Chapman & Scott Corp., New York, N. Y., are being built adjacent to the Glen Canyon Dam site on both sides of the Colorado River. M-C&S, general contractor for the $107,955,522 dam, has also started constructing barracks, mess halls, and trailer parks near the job area.

The company will begin to erect housing for its personnel in Page, Ariz., a new townsite being developed by the Bureau of Reclamation on the east side of Glen Canyon, two miles from the dam site. It is expected that by mid-1960, at the peak of work, M-C&S will employ about 2,000 men on the project.

Colorado Fuel & Iron names Baessler director

Karl H. Baessler has been appointed director of wire product development for the Colorado, Wickwire Spencer, and Pacific Coast divisions of the Colorado Fuel & Iron Corp., New York, N. Y. Baessler will continue to make his headquarters at the firm's Oakland, Calif., plant.

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PORTABLE ROTARY COMPRESSORS

Ever since 1902, Ingersoll-Rand has pioneered the outstanding developments in portable air compressors. Time after time these proved to be major steps in setting new standards of comparison. Each new model was acclaimed "the best ever" by users all over the world.

In 1950, when I-R introduced the Gyro-Flo — the first successful portable rotary compressor — it was the subject of much speculation and comment. Some thought that it would not stand up, others felt that this was the compressor they had dreamed of.

Today, although the Gyro-Flo is perhaps the most widely imitated compressor in history, it stands in a class by itself — unequaled in time-proven performance, dependability and low-cost maintenance.

The Gyro-Flo is available in six sizes — 85, 125, 210, 315, 600 and 900 cfm — the most complete line of portable rotary compressors in the world. And, certainly Gyro-Flo is the "greatest of them all."

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THE BEST AIR EQUIPMENT FOR BETTER HIGHWAYS

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Proper maintenance—a way to cut cable costs

Cable is an expendable item that has to be replaced frequently during the life of a machine. But contractors can cut down on the frequency of cable purchases—and save this money for other purposes—if they give cable a reasonable amount of care.

Cable actually consists of a group of closely fitted moving parts; individual wires are twisted together into strands, and strands are twisted together into rope.

Sharp bends or kinks cause rapid wear, since wires or strands are moved out of their relative positions and unequal tensions are created on the wires. When cable is being unreeled, pull it straight away from a rotating reel and do not let the reel rotate faster than the cable is being removed.

When cable is being removed from a reel that does not rotate, uncoil the length of the cable required and place one coil atop another.

Remember these points when installing new cable: always be sure to use the correct size of cable, and weld or bind ends of the strands together. This holds the strands in their relative positions. The strands on the cut-off end of the reel should also be secured. Do not drive nails through cable to secure it to a reel, for this will damage the wires. Install new cable on the drum in the direction of the natural coils.

The extent of cable lubrication depends on operating conditions. If the job site is dusty, cable should be lubricated sparingly, if at all, since this will make dust adhere to the lubricant and cause wear on both cable and sheaves. A film of lubricant will extend cable life in areas where rusting and corrosion are prevalent.

The operation and maintenance of cable-controlled equipment has a definite effect on cable life. Misaligned sheaves, and bad sheave grooves reduce cable life by causing excessive friction between the cable and other parts of a machine. Burned cable soon becomes brittle and cracks, and this leads to frayed strands and a weak spot in the cable.

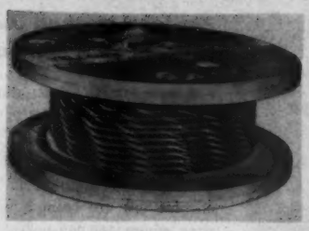
When a new cable has been installed, break it in easy. Avoid sudden starts or stops. Jerking out slack can break even a new cable. When wear becomes apparent, reverse the cable end for end. A small spare drum or reel of cable can be used on dozers so that a worn length can be cut off and the new cable pulled through the system far enough to replace the worn section.

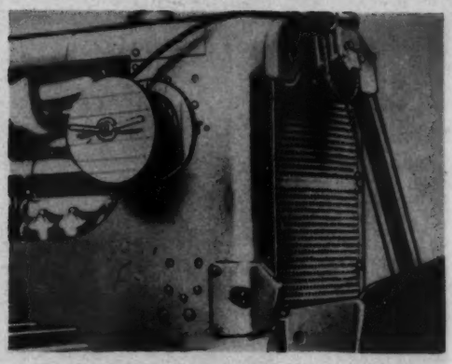
A similar technique can be used to extend cable life on scrapers.

M-H-F buys Mid-Western

Massey-Harris-Ferguson, Inc., Racine, Wis., has bought the assets, patents, and designs of Mid-Western Industries, Inc., Wichita, Kans. Mid-Western products will continue to be marketed under the Davis trade name. The acquired firm will become part of the M-H-F Industrial Division.

Charles J. Davis, president of Mid-Western, is division general manager.





After a length of cable is cut from a reel, above, secure the cut-off end to the reel to prevent fraying. A small, spare reel of cable, at right, mounted on this tractor-dozer, makes it easy for worn cable to be replaced.

THIS NEW CAT* DIESEL WAS SOLD 25 YEARS AGO

"A quarter of a century ago, we purchased the first Cat Diesel Sixty-Five Tractor made. We always have favored Caterpillar-built equipment because of its stability and dependability. In day after day running, you don't beat them for long life and minimum of down time."

JIM SHELDON, *General Superintendent*
Harms Bros., General Contractors, Sacramento, Calif.

The Caterpillar D397 powering this asphalt batching plant was sold on the performance of equipment used for the past 25 years. When Harms Bros. needed a dependable power plant for its Madsen asphalt batch plant, with a capacity of 5,000 pounds per batch, long experience had sold them on the dependability of Caterpillar Diesel Engines.

Yet this D397, rated at 650 HP (maximum output capacity), is even a better engine than previous models. It has higher horsepower. It is available with turbocharger, Roots blower, or in naturally aspirated or spark-ignition models. You have a choice of air, electric or gasoline starting.

There is a complete line of modern, heavy-duty Cat Diesel Engines to fit your every need. All of them come to you with honestly rated *certified power*. See your Caterpillar Dealer today for the exact size to fit *your* job.

Caterpillar Tractor Co., Peoria, Ill., U.S.A.

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Dept. C&E-S-2, Caterpillar Tractor Co., Peoria, Ill.

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A heavy mound of fill, composed of sand and chrome ore is dozed to a 25-foot peak at the Bayonne, N. J., refinery of Esso Standard Oil Co., where the pre-load method is being used in building foundations for new tanks. The mounds will be removed in April, when the new 150,000-barrel tanks will be erected.

Pre-load method used to build tank foundations

A new system of building foundations for storage tanks is being used in the general tank field at the Bayonne, N. J., refinery of Esso Standard Oil Co. Mounds of sand and chrome ore are being placed on the sites where 150,000-barrel tanks will be erected next year. These mounds will stay in place ten months to compress the organic soil and enable the surface to stand the weight of the huge tanks.

Usually, wooden piles are driven in places where the soil is soft, and tanks are erected on the piles. The new method, known as pre-loading, is equally effective but more economical. This is the first use of the method for construction of tank foundations, the pre-load foundation system has been used before, the best-known application being on the New Jersey Turnpike. At that time, mounds of fill were placed on top of the right-of-way through swamp lands and meadows where soil conditions indicated that unusual settlement might take place.

The 50,000 cubic yards of sand required for the foundations of three tanks is being brought to the refinery by barge, while chrome ore is delivered in trucks.

Settlement platforms, which are actually 6-foot-diameter steel plates, were placed at the sites of the three tanks, and 20-foot poles were welded perpendicular to the plates. The mounds—nearly 25-feet high at the peak—were built around these poles by tractor-dozer.

The poles were painted in a "candy stripe" fashion, but not for decorative purposes. This will permit settlement of the platforms to be measured. Early in April, the mounds will be removed so that work can start on construction of the tanks.

Flintkote appoints two new managers

Arnold Appleyard has rejoined the Flintkote Co., New York, N. Y., as sales promotion manager in the firm's Industrial Products Division. He will serve as sales promotion manager for Atlas adhesives, and a group of industrial products including Flintdek, Decoralt, Ortar, and Permaset mixes for underlayment and floor finishes.

Appleyard was formerly the Eastern division sales manager for the company.

The company also named O. H. Storey, Jr., product manager for the gypsum products, when Flintkote's new gypsum products plant is completed at Sweetwater, Texas, in the fall. Storey will make his headquarters at the firm's new building materials plant at Ennis, Texas.

Dr. Arnold J. Hoiberg has been appointed assistant research director and will make his headquarters at the company's research laboratory in Whippany, N. J.

HRB bulletin reports on bituminous surfaces

Bulletin 154, "Performance of Bituminous Surfacing", is available from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. The bulletin contains two papers, the first of which presents a comparison of experimental road test sections of asphaltic concrete for three years of service. This investigation was part of a cooperative study of the Kansas State Highway Commission and the applied mechanics department of Kansas State College.

The second paper details performances on several test sections of high-type bituminous concrete in North Carolina.

The bulletin is priced at 80 cents.

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Generator weight exerts loads on engine shaft and bearings. Causes more wear than in Thor's vertical mounting.

New Thor generator powering a Thor 7¼" SpeedSaw hastens construction of the new Congress Street Expressway in Chicago.

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THOR PORTABLE GENERATOR

Here's the brand new look in generator design—Thor's all-new 1500 watt portable engine-driven generator with vertical mounting.

This handy, compact power plant—available in AC and DC models—is the real answer to the builder or contractor who needs a rugged, portable power source. Check these features, then check your Thor distributor for a demonstration. • **Revolutionary design—vertical shaft engine • Light weight—95 lbs. Strong tubular framework protects unit, assures handling ease. • Heavy duty automatic rewind starter—easily removable for repair. Off-on toggle-type switch. No shock danger • Drip-proof construction—keeps fuel and moisture from entering generator • No-creep—stays put while running, yet slides easily when moved.** Thor Power Tool Co., Prudential Plaza, Chicago 1, Ill.

Thor PORTABLE POWER TOOLS

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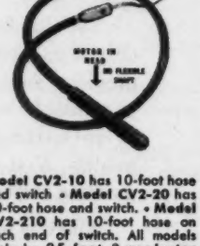
Universal Electric Motor-in-Head Concrete Vibrator



Model CV2-10 has 10-foot hose and switch • Model CV2-20 has 20-foot hose and switch. • Model CV2-210 has 10-foot hose on each end of switch. All models include 25-foot 3-conductor electric cable.

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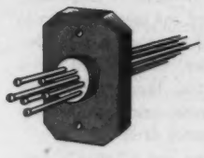
World Conference studies prestressed concrete



by RALPH MONSON, field editor

Delegates of all nations pack the opening session of the conference at the Fairmont Hotel in San Francisco. Practically every session had a capacity audience like this one.

Prestressed concrete was the topic of the week in many languages as nearly 1,500 delegates from all parts of the world gathered at the Fairmont Hotel in San Francisco from July 27 through August 2 to participate in the first World Conference on Prestressed Concrete.

Largely responsible for the excellent conference program is Prof. T. Y. Lin of the Division of Civil Engineering, University of California.

Presented by the University of California Department of Engineering and University Extension, the program was made possible by the cooperation of eleven national and international societies.

Among those attending the sessions were representatives from practically every state and province of the United States and Canada and from 27 foreign countries. Practically every European country west of the Iron Curtain was represented, together with Poland and Russia. Several Central and South American countries sent delegations, as did such distant lands as Japan, China, and New Zealand.

While two similar international conferences have been held in Europe in recent years, this was actually the first world-wide conference devoted to the problems of the booming prestressed concrete industry.

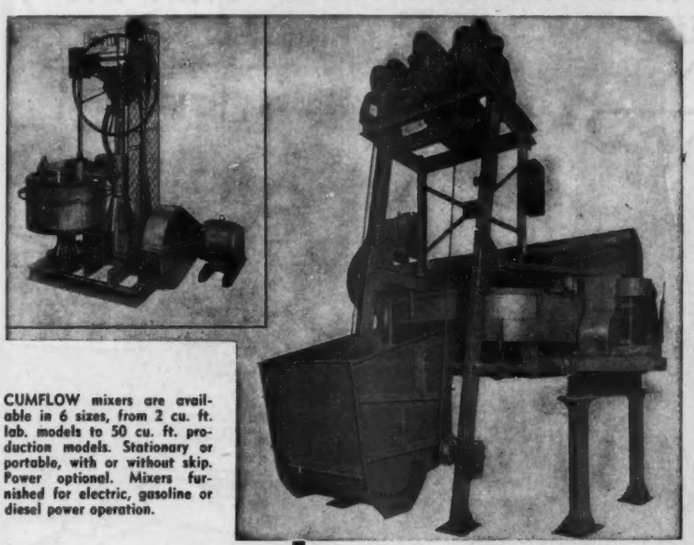
Keynoting the conference at the opening session Monday morning, William E. Dean, assistant state highway engineer of the State of Florida, observed that the relatively young prestressed concrete industry already has at its disposal a tremendous volume of advanced technology. He suggested that it is now up to the technical press to disseminate this information.

While emphasizing the importance of prestressed concrete in the thousands of structures to be built during the next few years under the Federal Interstate Highway program, Dean warned the delegates to exercise extreme care and diligence in the design, manufacture, and erection of structures containing prestressed members.

(*Continued on next page*)

CUMFLOW SCIENTIFIC MIXING SYSTEMS

Manufactured by THE LINER CONCRETE MACHINERY COMPANY, LTD., of Gateshead, England



CUMFLOW mixers are available in 6 sizes, from 2 cu. ft. lab. models to 50 cu. ft. production models. Stationary or portable, with or without skip. Power optional. Mixers furnished for electric, gasoline or diesel power operation.

The CUMFLOW SCIENTIFIC MIXING SYSTEM is designed and built expressly for the precast and prestressed concrete industries. Using this system you can obtain from 15 to 40 uniformly mixed batches of concrete per hour. CUMFLOW mixes any type concrete desired—slump, plastic or wet mix, lean or rich mix, fine or coarse mix, light or heavy mix—with 100% efficiency and uniformity.

The CUMFLOW SCIENTIFIC MIXING SYSTEM consists of a mixer star supported eccentrically over the mixing pan. The star revolves at a relatively high speed. Blades attached to the star are arranged so as to obtain the maximum number of points of intersection during revolution. Batched materials are fed continuously to the mixing star by the pan's revolutions and are mixed evenly and thoroughly in a matter of seconds. Further mixing action is obtained by fixed side blades. This unique system gives an absolutely clean pan after each discharge—no part of the mix is carried over to the next batch.

The CUMFLOW SCIENTIFIC MIXER SYSTEM was perfected after years of research to meet a growing demand by engineers for a more intensive mixing element which would give them complete control of the product at all stages . . . a feature not obtainable in conventional-type mixers.

One user of this system, with a cement bill of $1,000,000 a year, says: "On tests, we have found Mixer A gave us 4,200 psi; the CUMFLOW gave us 6,000 psi concrete. We reduced the cement content in the CUMFLOW by 25% and were able to obtain 5,000 psi concrete. We have also obtained concrete of 10,000 to 11,000 psi in this mixer.

The CUMFLOW SCIENTIFIC MIXERS, manufactured by the Liner Concrete Machinery Co., Ltd., Gateshead, England, are built on the lines of a machine tool. They are not to be confused with conventional-type mixers. Available on a world-wide basis, with several parts depots maintained in America for prompt replacement service.

To realize savings of from 10% to 25% on cement costs, and to produce uniform mixes every time, write us, advising in cu. yds., the production needs per hour of your plant. We will promptly forward details of the size mixer best suited to your needs.

CHECK THESE IMPORTANT ADVANTAGES

- Every batch uniform; no variations whatsoever
- Greater strength concrete with minimum cement content
- Balling or segregation impossible
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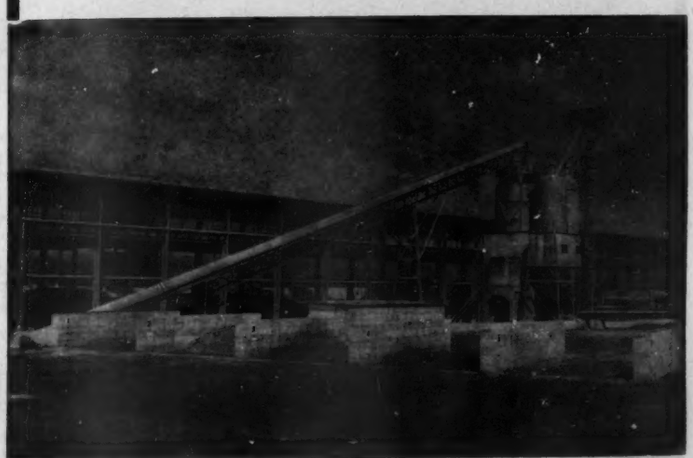
- Up to 11,700 psi concrete possible
- From 10% to 25% savings in cement content



The Basalt Rock Co., Inc., Napa, California, is one of the many North American users of LINER CUMFLOW SCIENTIFIC MIXER SYSTEMS.

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(Continued from preceding page)

Delegates to the World Conference visit the exhibit booths set up in the Fairmont Hotel. On display are all types of equipment, supplies, and materials used in making and handling prestressed-concrete units.

Present papers

For four solid days of the five-day conference, a thousand or more delegates overflowed the meeting room to hear a series of technical papers. One day, Wednesday, was devoted to a field trip to two large prestressing plants and several bridge projects in the San Francisco area.

Each morning and afternoon program was devoted to a specific phase of the general subject, with four or five technical papers discussing specific problems in this phase. Movies showing specific job applications were presented at the two evening sessions.

Emphasizing the truly international character of the conference, Prof. W. Zerna of Hanover Technical University, Hanover, Germany, opened the first technical session with a discussion of post-tensioning systems and new grouting methods being used in Germany. There, he explained, hot-rolled and heat-treated steels are commonly used instead of cold-rolled steel, and sections are frequently oval-shaped intsead of round.

Continuing this session on materials and techniques, W. O. Everling of American Steel & Wire Division of U. S. Steel and Lloyd E. Hill of John A. Roebling's Sons Corp. presented papers on prestressing steels. Everling reviewed recent studies on the behavior of prestressing steels under stresses in the range of 80 to 98 per cent of the ultimate. Corrosion sensitivity and the protection of prestressing wires from corrosion were also discussed.

Both speakers urged specification and code writers to avoid establishing limiting types of codes or specifications which might prematurely throttle the imaginative thinking of designers, manufacturers, and contractors.

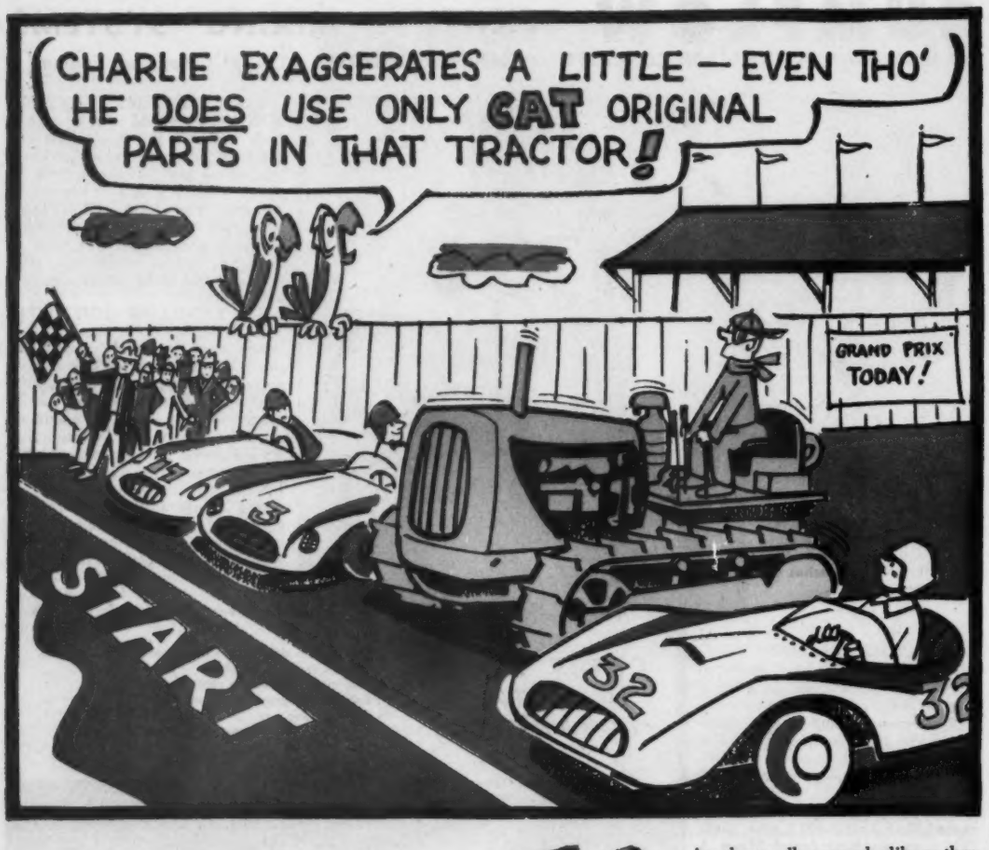
The rapid advance in the technology of producing and using high-early-strength concrete was obvious throughout the sessions. Speakers talked of compressive strengths of 10,000 psi at 28 days, and of the 15-hour strengths of 3,000 psi now being attained in plants producing prestressed sections. The techniques, materials, and equipment used to obtain such early and high strengths were discussed by Paul Klieger of the Portland Cement Association in the general session on techniques and materials. Other speakers gave specific examples in describing certain projects during other sessions.

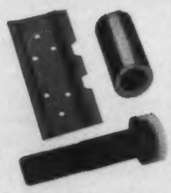
Using lightweight concrete for prestressed members presents a few special problems and these were highlighted in a talk by Truman R. Jones, Jr., of Texas A & M. He described the results of a series of laboratory tests comparing concrete made with lightweight aggregate and with sand and gravel concrete. His conclusion from the study of these tests was that the difference between the physical properties of the two was largely a matter of degree and that, with some limitations, the lighter material might be expected to act very much like standard concrete.

Cover specific problems

The conference got down to actual experiences in the design and construction of specific types of prestressed structures during a series of sessions that was devoted to bridges, buildings, pavements, wharves, piles, and dams.

In the session on bridges, Arthur L. Elliott of the California Division of Highways described some of the difficulties his department and the contractors have had in building the 60-odd prestressed-concrete bridges for California highways. Again, the matter of limiting specifications came up as Elliott suggested that only end results be specified, with the contractor left to work out his own means.





Are they really as much alike as they look? Steel used in industrial standard bolts must withstand 120,000 pounds pull per square inch—CAT* bolts must withstand *at least* 151,000 PSI. Same with other Cat original track parts—higher standards. With "look-alike" track parts, who knows? Be sure to get parts you can trust—from your Caterpillar Dealer. He always has *exactly* the part you need. Call on him anytime.

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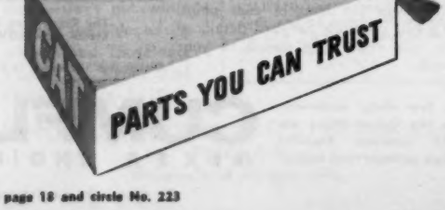

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"Otherwise," he said, "we stifle his ingenuity."

Since many contractors are still inexperienced in the techniques of building with prestressed concrete, Elliott added, the manufacturers and suppliers of prestressing materials and of prestressed units have the obligation to see that what they supply is properly used.

Continuing the bridge session, E. L. Erickson of the U. S. Bureau of Public Roads outlined the background and intent of the "Criteria for Prestressed Concrete Bridges", published by the Bureau in 1955. This publication, he explained, is the only design guide for structures acceptable for federal-aid projects.

Papers by consulting engineers W. F. Palmer of Palmer & Baker and M. E. Bender of Joseph K. Knoerle & Associates described specific construction problems on the Lake Pontchartrain Causeway in Louisiana and on the prestressed bridges for the Illinois Toll Highway which is currently under construction in the Chicago area.

Widely used in buildings

That the use of prestressed elements for building construction is one of the most rapidly expanding phases of the industry was evidenced by the emphasis placed on this phase at the convention. The delegates filled the large meeting room for the Tuesday afternoon technical session on prestressed buildings (as they did for the other sessions) and then returned in the evening to view a series of films on specific construction operations.

Consulting engineer Ross H. Bryan opened the session with a talk on the prestressed floor and wall panels used in the $70 million Listerhill, Alabama, plant of Reynolds Metals Co.

Dutch experiences with the use of prestressing cables in concrete-shell structures were described by Prof. A. M. Haas of Delft University, Netherlands. Here, a few prestressing cables have been added to the conventional reinforcement of concrete shell roofs to delay or prevent the occurrence of incidental cracking due to creep, temperature, or other unforeseen causes.

The question of the fire resistance of prestressed elements was the subject of papers by A. W. Hill of the Cement and Concrete Association, London, and L. A. Ashton of the Fire Research Station, Hertfordshire. Reviewing the research carried out at the Fire Research Station in England, these men expressed the conclusions that prestressed-concrete sections were less resistant to fire and extreme heat than sections with conventional reinforcement.

This lower resistance to heat, they said, was due to the smaller size of the sections and to the fact that the steel in prestressed sections is more susceptible to high temperatures than that commonly used in conventional reinforced-concrete structures.

Experiences with prestressed lift slabs on California public buildings were described by Charles Peterson and A. H. Brownfield of the Califor-

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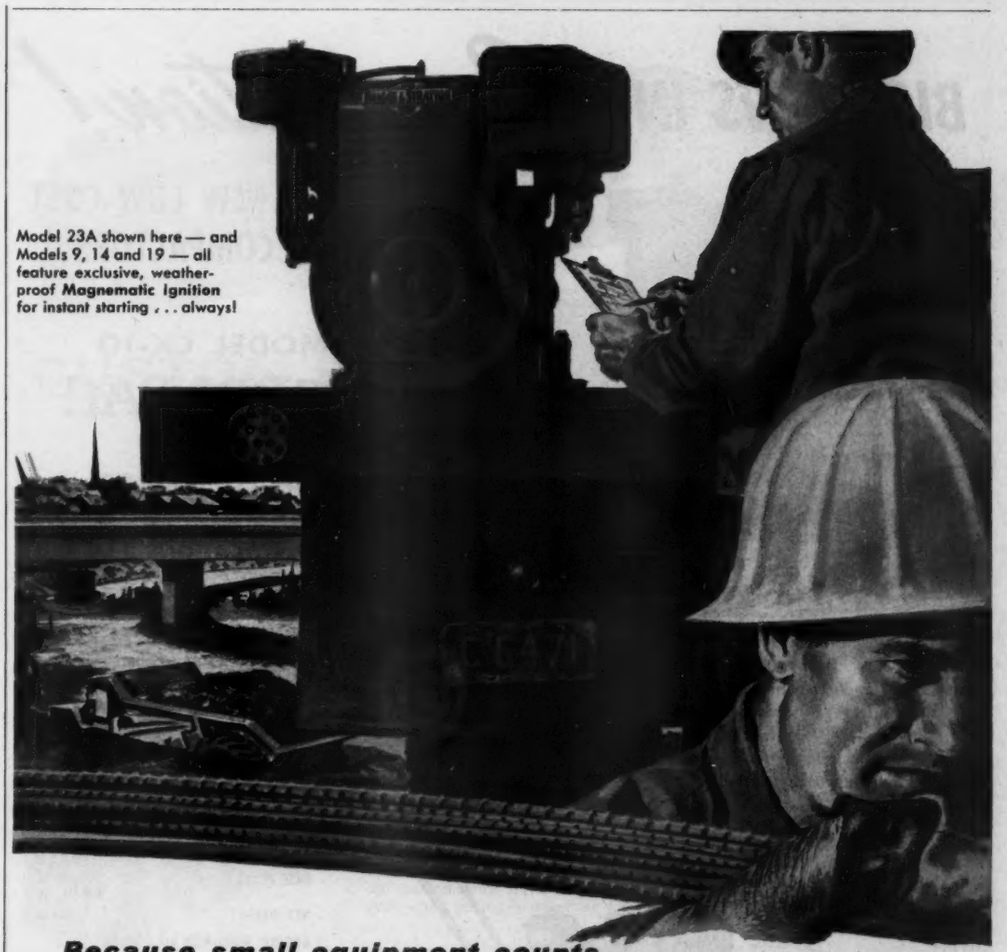
Delegates to the conference watch pretensioned concrete piles being manufactured at the plant of Ben C. Gerwick Co., Petaluma, Calif., during the Wednesday field trip. A sound truck, background, gives details of the operation.



Model 23A shown here — and Models 9, 14 and 19 — all feature exclusive, weather-proof Magnematic Ignition for instant starting . . . always!

Because small equipment counts in making big contracts pay . . .

it pays to insist on Briggs & Stratton power

Yes, progress on even the biggest jobs often depends on the vital chores performed by small pumps, concrete mixers and finishers, power lubricators, generators, vibrators, tampers and many other kinds of construction equipment . . . and on the engines that power them.

That's why so many of the leading builders of these machines specify Briggs & Stratton 4-CYCLE engines — to be sure of dependable, quick starts . . . rugged smooth-running performance regardless of weather or tough working conditions. That's why it will pay you to insist on these *power partners* (to 9 hp) . . . why Briggs & Stratton engines are *No. 1 in use throughout the world.*

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(Continued from preceding page)

Miss Nancy English provides a live load for a structure showing how prestressing works at the booth of Rods, Inc., Berkeley, Calif.

nia Division of Architecture. They indicated that where competitive bids have been taken on alternate types of construction, the prestressed lift slabs have been less expensive by small margins. However, they added, experience has shown an important advantage in that there is less deflection in the prestressed slabs. Peterson predicted a bright future for this type of building construction.

Prestressing abroad

Design and construction in various countries was the subject of the Thursday morning session with Prof. Franco Levi of Torino, Italy, leading off. He cited examples of prestressing on bridges, industrial buildings, and other structures in Italy, noting that prestressed construction was often combined with more conventional methods in these buildings. Prestressed barrel-arch roofs built in Italy were described and explained.

The advantages of prestressed concrete in resisting earthquake stresses were emphasized by Professor Shizuo Ban of Kyoto University, Japan. Prestressed rigid building frames have proved very resistant to earthquakes, he said, although he indicated that it was usually not practical to design them strong enough to eliminate all cracking under earthquake stresses. These stresses probably only occur a few times during the life of a structure.

Dr. Fritz Leonhardt of Stuttgart, Germany, described the use of concentrated prestressing tendons in long-span bridges built in Germany. One of the unusual structures he described was a 1,200-foot bridge of 5 spans in which the concentrated tendons were carried in a special box attached to the side of the web of the girder. At the ends, the tendons were spread into a fan-like anchorage.

Self-anchored prestressed-concrete suspension bridges were the subject of a talk by Prof. D. C. C. Vandepitte of the University of Ghent, Belgium. In these structures, he explained, the suspension cables serve to prestress the concrete deck girders. One of these structures has been built and another is under construction in Belgium.

The design and testing of prestressed-concrete pavements for airfields was discussed in the Thursday afternoon session by Frank M. Mellinger of the U. S. Army Corps of Engineers, Cincinnati, Ohio. He described tests of a 4-inch prestressed overlay over a concrete runway section and concluded that although prestressed concrete was more expensive, it had, in this case, advantages of fewer joints, conservation of materials, and smoother surface.

Three Americans, Ben C. Gerwick, Jr., and W. J. Talbot of Ben C. Gerwick, Inc., San Francisco, and M. F. Fornerod of Raymond Concrete Pile Co., New York, continued the discussion with papers on prestressed-concrete piling and marine structures. The many advantages of prestressing for these structures include durability, resistance to sea water, and high load value both in bearing and uplift. Prestressed piles are available in a wide range of shapes, sections, and lengths to fit specific needs.

Prestressed dams in Algeria were described by Jean Muller of Paris, France. The design and construction of the large, multiple-arch Djen Djen Dam presently under construction were explained together with several earlier applications of the method. Of particular interest was the discussion of prestressed anchorages, in which the dam foundation is prestressed to the rock and the several rock strata simultaneously put under compression.

BIG NEWS IN *Compaction!*

MEET OUR TWO NEW LOW-COST VIBRATORY COMPACTORS

MODEL CK-10
TERRAPAC
VIBRATORY
SOIL COMPACTOR

SPECIFICATIONS

FREQUENCY	2,300 V.P.M.	WIDTH OF DRUM	55 INCHES
IMPACT	5 TONS	TOTAL LENGTH	88 INCHES
TOTAL WEIGHT	3,100 LBS.		

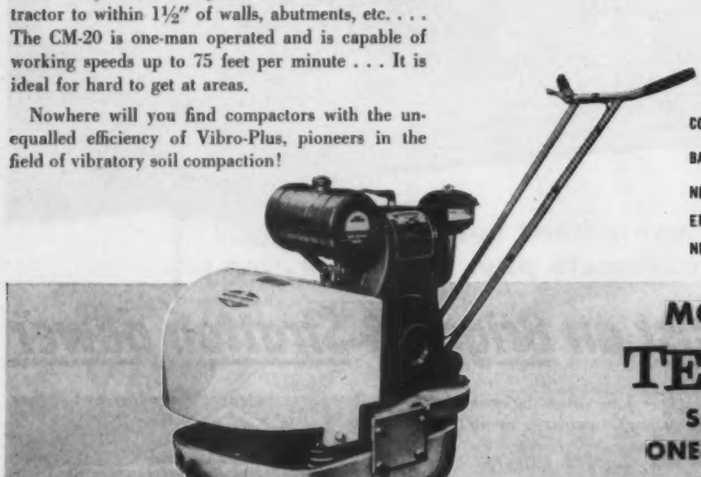
ENGINE: AVAILABLE WITH WATER OR AIR-COOLED ENGINE

Two new compactors are coming off the Vibro-Plus assembly line . . . Both are low-cost units, yet each retains high production capacity . . . The model CK-10 may be towed by the smallest rubber-tired tractor to within 1½" of walls, abutments, etc. . . . The CM-20 is one-man operated and is capable of working speeds up to 75 feet per minute . . . It is ideal for hard to get at areas.

Nowhere will you find compactors with the unequalled efficiency of Vibro-Plus, pioneers in the field of vibratory soil compaction!

SPECIFICATIONS

COMPACTION FORCE	6,600 lbs. @ 2,000 V.P.M.
BASE PLATE	LENGTH 34" WIDTH 20"
NET WEIGHT	950 lbs.
ENGINE: WISCONSIN AIR-COOLED	
NET WEIGHT	950 LBS.



MODEL CM-20
TERRAPAC
SELF-PROPELLED
ONE-MAN OPERATED

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VIBRO-PLUS PRODUCTS
INCORPORATED
STANHOPE, NEW JERSEY
WORLD'S LEADING MANUFACTURER OF VIBRATORY EQUIPMENT FOR OVER TWO DECADES

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Research on prestressed concrete is being conducted currently at a number of universities and other research centers. Reports on a number of these projects were made at the Friday morning session.

The concluding technical session of the conference featured a review of manufacturing practices in England, the United States, Russia. Peter J. Verna, Jr., of Concrete Materials, Inc., Charlotte, N. C., pictured a typical American plant and its operation. He particularly praised the hauling and erection people for their part in transporting and placing the heavy sections economically. Verna said, however, "Designers need to understand forms and production."

E. W. H. Gifford of Southampton, England, pictured and explained the sectional method commonly used for complicated structures in England. Elements of the structure are manufactured in plants, then hauled to the job and assembled into sub-assemblies which are prestressed before or after being placed in the structure.

The final paper of the meeting was presented by Prof. V. V. Mikhailov of Moscow, U.S.S.R., and was entitled "Automation in Production of Prestressed Units". Mikhailov showed pictures and described processes used in Russia for the production of prestressed elements for structures where huge machines placed the tensioning wires in the forms very rapidly and with a minimum of manpower.

Jack Streblow gets a big share of the credit for the good press setup and the exhibit layouts.

On Wednesday, nearly a thousand delegates boarded 24 buses to get a firsthand look at a number of prestressed concrete bridges in the San Francisco area and to visit two of the largest area plants producing prestressed concrete units—the plants of Ben C. Gerwick, Inc., at Petaluma, Calif., and Basalt Rock Co., Inc., at Napa.

Returning late in the afternoon, the delegates spent the evening viewing a series of films on specific prestressing projects and problems.

Luncheon meetings, sponsored by the manufacturers, were held on Tuesday and Thursday noons. Panel discussions at these sessions featured the techniques and methods of manufacturing prestressed concrete and the marketing of prestressed-concrete products. A question-and-answer period followed each of these discussions.

Societies join in sponsorship

The World Conference was sponsored jointly by the following societies: Prestressed Concrete Institute, International Federation for Prestressing, National Science Foundation, American Concrete Institute, American Society of Civil Engineers, American Association of State Highway Officials, Association of American Railroads, American Institute of Architects, Associated General Contractors of America, Structural Engineers Association of California, and Portland Cement Association. J. Ashton Gray was chairman of the advisory committee, and T. Y. Lin was program chairman and conference coordinator.

PCI elects officers

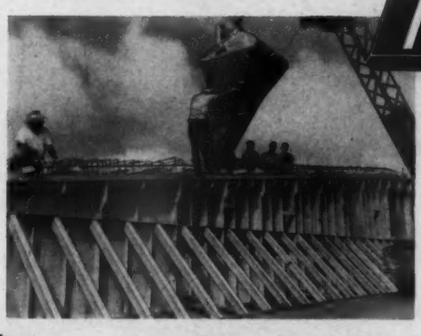
Preceding the opening of the World Conference, the third annual business meeting of the Prestressed Concrete Institute was held. Executive secre-

(Continued on next page)

A friendly looking "Ductosaurus", made up of a rubber Ductube and a few accessories, greets visitors to the booth of International Prestressing Corp., Los Angeles, Calif., in the exhibit hall.

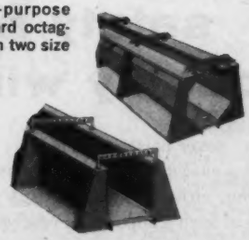
FOR STANDARD OR
CUSTOM PRESTRESSED FORMS
...look to the leader Form-Crete

This custom designed Form-Crete form was used to cast huge prestressed roof girders shown above for a large storage warehouse building. These girders are 101 ft. 6 in. long with a height of 11 ft. at the center tapering to 4 ft. at the ends. Top slab width is 3 ft.—weight 71 tons.



Standard Form-Crete Bridge Beam forms offer trouble-free, fast, efficient casting operations. Rugged steel construction enables the producer to handle the individual form length at one time when pulling or resetting forms.

These versatile multi-purpose square forms and standard octagonal forms are available in two size classifications covering piling ranges of 12" to 18" and from 18" to 24". Pilot liners for any particular size within range limits are available. Ring headers provide for use of void tubing for hollow piling casting.



Whether your needs call for one of the many standard all steel forms or one of a special design, you'll find a ready answer when you call on Form-Crete. Stock or custom, Form-Crete steel forms are designed to produce the highest quality finished product, a product you can be proud to deliver to the job; and Form-Crete steel forms are versatile too. These multi-purpose forms offer maximum interchangeability throughout the entire size range of square piling and beam shapes. For custom forms, a special Form-Crete consultant service is ready and interested in applying a wealth of experience in designing the forms that meet your requirements. Call on Form-Crete, rely on Form-Crete for the finest in all steel forms delivered on time, when and where you want them.

Get into the profitable prestressed concrete business now with Form-Crete steel casting forms. Send for illustrated Bulletin 200.

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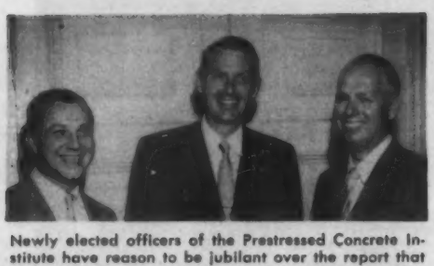
(Continued from preceding page)



Newly elected officers of the Prestressed Concrete Institute have reason to be jubilant over the report that the group's membership has tripled in the past year. Left to right are secretary-treasurer Peter J. Verna, Jr., of Concrete Materials, Inc., Charlotte, N. C.; president Ben C. Gerwick, Jr., of Ben C. Gerwick Co., Inc., San Francisco; and vice president Harold Price of Basalt Rock Co., Inc., Napa, Calif.

tary Martin Korn told the delegates that the association's membership had tripled since the meeting in Florida a year ago and was increasing daily as non-members in attendance at the Conference applied for membership.

Dr. A. M. Ozell reported on the recently completed two-year research project at the University of Florida. The four-part project included studies of curing, columns, composite structures, and continuous structures. The complete report will be released in the near future.

Charles Zollman, chairman of the Technical Activities Committee, reported that a specification has been developed and published for pretensioning. The committee is working on a similar specification for post-tensioning.

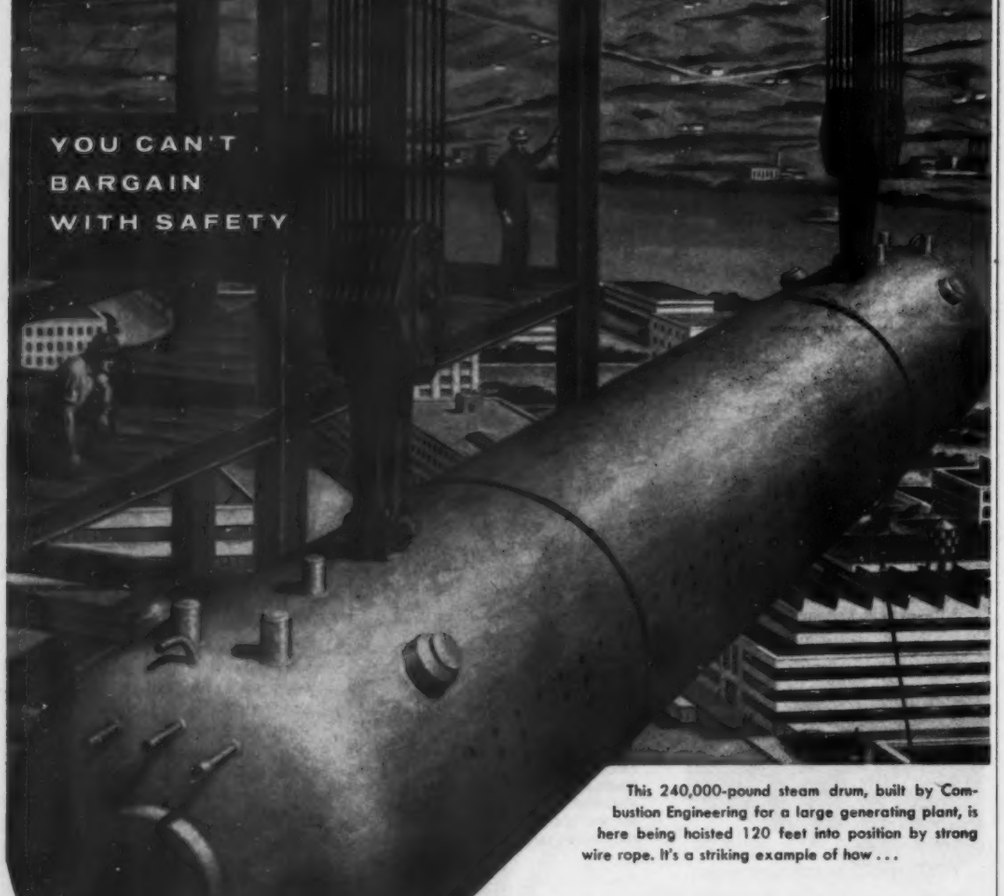
It was announced at the meeting that William E. Dean of the Florida Highway Department had been awarded the E. N. Howard award for outstanding contribution to the advancement of prestressed concrete. The award is made by the American Society of Civil Engineers and will be presented at the Society's annual meeting.

Officers elected at the meeting were president, Ben C. Gerwick, Jr., of Ben C. Gerwick Co. Inc., San Francisco; vice president, Harold Price of Basalt Rock Co., Inc., Napa, Calif.; and secretary-treasurer, Peter J. Verna, Jr., of Concrete Materials, Inc., Charlotte, N. C.

Eight members of an enlarged board of directors were elected. They are Phillip Balcomb of the Amdek Division of American Marietta, Pottstown, Pa.; Forrest Burtch of John A. Roebling's Sons Co., Inc., Trenton, N. J.; Mike DuBois of Freyssinet Co., New York City; and Jacob Whitlock of Midwest Prestressed Co., Springfield, Ill. These four members will serve one-year terms.

Elected to two-year terms on the board were Dr. T. Y. Lin of the University of California, Berkeley, Calif.; Ashton Gray of Dura-Stress, Inc., Leesburg, Fla.; George W. Ford of R. H. Wright & Sons Co., Fort Lauderdale, Fla.; and Douglas Cone of Florida Prestressed Concrete Co., Tampa, Fla.

The Prestressed Concrete Institute will hold its next annual meeting in Chicago in late September or early October of 1957. At its San Francisco headquarters, the PCI Board of Directors agreed to give priority to the development of fire rating data for prestressed units. THE END



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Avoid legal pitfalls

Contractor not liable for injury to child

THE PROBLEM: *A trench around a building under construction was bridged by two overlapping boards for wheeling materials into the building. Two sand piles and other things outside the building attracted neighborhood children to the premises. There were no warning signs, and children had not been ordered off the premises. A five-year-old boy, walking across the "bridge", displaced the boards, fell, and was injured. Was the contractor liable?*

THE ANSWER: No. (Patterson v. Gibson, 287 S. W. 2d 853, decided by the Missouri Supreme Court of Appeals.)

The court decided that although the boy was not a trespasser to whom the contractor owed no duty except that of not wantonly injuring him, he was a "bare licensee"—that is, he was permitted to be on the premises. The court noted that the bridge could not be regarded as inherently dangerous, and under such conditions; the contractor was not liable. The court also added that if the contractor were liable for the injury to the boy, then there would be corresponding liability where loose boards are left across rafters or joists in any uncompleted building frequented by curious children. "That can hardly be the law. Some hazards are presented in substantially all construction work—to the workmen and to those who may intrude upon the premises."

The opinion of the court is interesting chiefly for its citation of its own previous decisions and those of the Missouri Court of Appeals. In one case (Hull v. Gillioz, 344 Mo. 1227, 130 S. W. 2d 623), 43-foot steel I-beams were so piled on a construction storage lot that the top one was insecure enough for children to be able to rock it back and forth. In doing so, one child was seriously injured. The lot was unfenced and close to a public sidewalk, and children had habitually played there. Damages were allowed on a theory that the defendant had culpably permitted an inherently dangerous condition to exist in spite of the fact that such an accident as the one that occurred was liable to happen.

But in another case (Witte v. Stifel, 126 Mo. 295, 28 S. W. 891), the court had decided that there was no liability for injury to a seven-year-old boy who had pulled down on himself a 600-pound slab of loose rock that had been in a window opening in a building under construction, even though the window was close to a public sidewalk.

In still another case (Holifield v. Wigdor, 361 Mo. 636, 235 S. W. 2d 564), a five-year-old boy drowned in an excavation that had been prepared for installation of a tank. The excavation had been filled by rainwater. The Missouri court decided that the condition was of such temporary nature that it could not be regarded as an attractive nuisance. Damages were denied.

In the fourth cited case, the North Carolina Supreme Court approved an award of damages on account of injury to a three-year-old child who stepped into a bed of hot ashes on land which a contractor was clearing and grading. The court said that the contractor should have foreseen the accident because it knew that the area was frequented by children.

Extra work clause waived

THE PROBLEM: *A building contract provided that the owner might order extra work, and another paragraph specified that extra work should be covered by written agreement. The owner requested extras and the contractor complied without either mentioning need for a written agreement. Was the contractor entitled to extra pay?*

THE ANSWER: Yes. (Wilson v. Keefe, 309 Pac. 2d 516, decided by the California District Court of Appeal, Second District, Los Angeles.)

Edited by A. L. H. STREET
Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Engineer's right to act as architect

THE PROBLEM: *Under Connecticut law could a registered professional engineer compel payment under a contract to perform architectural services?*

THE ANSWER: No. (Douglas v. Smulski, 131 Atl. 2d 225, decided by the Connecticut Court of Common Pleas, Hartford County.)

The court said that although a registered engineer may perform architectural work that is incidental to engineering services, he may not do an entire architectural job. The decision is subject to possible review and reversal by the Connecticut Supreme Judicial Court.

(*Continued on next page*)

New SUPERIOR Heavy-Duty SCREED SUPPORTS

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For Use with 1¼" and 1½" I.D. Pipe Screeds and Vibratory Screeding Equipment

ADJUSTABLE SCREED HOLDER

Consists of a 1" threaded rod to which is welded a cradle to hold the pipe screed. This cradle is slotted as shown so that the arms may be bent over to secure the 1¼" or 1½" I.D. pipe screed. Threaded onto the rods is a half nut which provides the adjustment.

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These Screed Supports are designed to take the heavy loads imposed by traveling vibrating screeding equipment. The Bases for the screed holders are of two types: (1) The Metal Base for use on structural steel members; (2) the Chair-Type Base for use on a plywood deck.

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Abutters' petition limits paving of city street

THE PROBLEM: *The power of a Louisiana city to pave a street to be paid for out of special assessments against the abutting property depended upon a petition by property owners. A petition called for paving a street between two avenue intersections. On granting the petition could the municipal authorities legally extend the pavement beyond one of those intersections?*

THE ANSWER: No. (Gamburg v. City of Alexandria, 85 So. 2d 276, decided by the Louisiana Court of Appeal, Second Circuit.)

The court said that the limits fixed by the petition not only precluded extension of the street but also prevented material alteration of curb lines to the prejudice of an abutter.

The court referred to a previous Louisiana Supreme Court decision that a petition by abutting property owners for improvements not to cost more than a stated price per running foot did not authorize award of a contract at a larger price (51 La. Ann. 1345, 26 So. 70). Another decision by that court stated that street-paving contract specifications must conform to the specifications upon which competitive bids are invited, even though the contractor is the only bidder (210 La. 106, 26 So. 2d 370).

Sub exempt from liability

THE PROBLEM: *A general contractor rented a crane from a subcontractor who also furnished the operator. While a steel truss was being hoisted by the crane it fell, fatally injuring one of the general contractor's employees. The widow was awarded workmen's compensation benefits under Virginia law. Could she then sue the subcontractor for damages?*

THE ANSWER: No. (Rea v. Ford, 96 S. E. 2d 92, decided by the Virginia Supreme Court of Appeals.) The court said that, under the wording of the law, the subcontractor was exempt from liability even if the accident was due to a defect in the crane or to negligence of the operator in hoisting the truss.

Money found in excavating belongs to landowner

THE PROBLEM: *A landowner hired a contractor to construct a concrete floor in a garage. In using a pick to loosen soil, the contractor's employee found $1,000. The date of issue indicated that the money had not been buried more than 12 or 13 years. The property had changed hands in the meantime, and the owner of the currency was unknown. Who was entitled to possession of the money—subject to claim by the true owner—the landowner or the contractor?*

THE ANSWER: The landowner. (Schley v. Couch, 284 S. W. 2d 333, decided by the Texas Supreme Court.)

The court decided that the money should be classified as "mislaid" property, and not as "treasure trove" or "lost" property. Had it been lost property, the finder would have been entitled to it, assuming that the owner of the premises had not buried the money.

Treasure-trove rights have never been recognized in Texas. The rule now recognized by the courts generally is that a finder's right to possession of buried money must rest upon an assumption that it is "lost", not "mislaid" property.

"Mislaid property is presumed to be left in the custody of the owner or occupier of the premises upon which it is found, and . . . generally . . . the right of possession to mislaid property as against all except the owner is in the owner or occupant of such premises."

On the same line, this interesting question also comes up: Suppose that an excavating contractor uncovers a meteorite or some other object fallen from the sky. In this unusual event, would his find belong to him or the landowner?

According to a decision by the Iowa Supreme Court (Goddard v. Winchell, 86 Iowa 71, 52 N. W. 1124), it would belong to the landowner. The court said that an aerolite embedded in soil belonged to the owner of the land, rather than the finder, on a theory that the owner had lost or abandoned it. "Whence it came is not known, but . . . it became a part of this earth and should be treated as such."

Employer not liable for careless injury

THE PROBLEM: *A California safety rule requires that any hole cut in a floor in the course of construction should either be covered or fenced by railing. A fireplace opening had been covered, but the covering had been removed for the convenience of masons. A heating subcontractor's employee, aware of the opening, fell into the opening when he stepped down from a nearby sawhorse. Was the general contractor liable?*

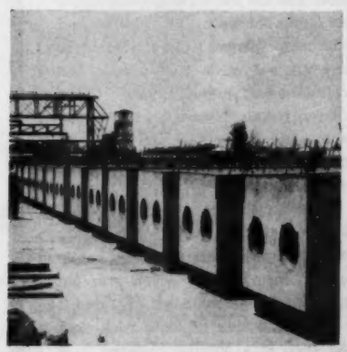
THE ANSWER: No. (Mula v. Meyer, 282 Pac. 2d 107, decided by the California District Court of Appeals, First District, San Francisco.)

This was a damage suit and not a workmen's compensation proceeding,

Railroad bridge deck built-w

Nearly-finished bridge from the underside. Note depth of slabs forming the deck.

Photo shows precast slab riding to its resting place.



Close-up of voided slabs showing hollows formed by 16" O.D. SONOVOID Fibre Tubes.

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LOS ANGELES, CAL. MONTCLAIR, N. J.

and the court applied the general rule of law that, even when injury has resulted from the defendant's negligence, the plaintiff cannot collect damages if the accident was caused more directly through the plaintiff's neglect to guard himself against a known danger.

The court said that "contributory" negligence is no less a bar to a claim based on violation of a statutory safety measure than when based upon common-law negligence.

Interest is allowed on unliquidated claim

THE PROBLEM: *On termination of a subcontract for building construction —which allowed 20 per cent override on actual costs—dispute arose with the prime contractor on questions of whether certain items could be included as cost, the proper amounts allowable if these items could be included, and whether the 20 per cent override applied before or after deductions. (1.) Was interest on the sum, finally determined by suit, to be allowable to the subcontractor under the rule that interest runs from the date that the balance due is liquidated—that is, where the balance is a mere matter of computation of figures? (2.) If not, was interest allowable—not necessarily at the legal rate—as damages for the prime contractor's failure to pay what was due when it was due?*

THE ANSWERS: (1.) No. (2.) Yes. (E. I. Du Pont De Nemours & Co. v. Lyles & Lang Construction Co., 219 Fed. 2d 328, decided by the United States Court of Appeals, Fourth Circuit.)

The court said that "litigation was just as necessary to determine the amount due under the contract as it would have been in the ordinary case to determine damages for breach". The subcontractor's claim, therefore, could not be said to be for a sum that had been liquidated. The court cited other decisions to the effect that when justice requires, damages for withholding the use of money may be awarded in the nature of interest from the time payment should have been made.

But the court upset the trial court's conclusion that interest should be allowed at 6 per cent, the legal rate in South Carolina, where the suit had originated. The Court of Appeals said that because, in a case of this kind, interest is awarded as compensation for being deprived of the use of the contract proceeds, it should not be computed at the legal rate, but rather at the rate the plaintiff, the subcontractor, "would have had to pay upon a loan of a similar amount, considering the state of the money market and the rate charged by banks for the use of money".

Owner of temporary bridge

THE PROBLEM: *A temporary bridge was constructed by a state highway contractor for use pending permanent construction of another bridge. When the temporary bridge was demolished, the materials would belong to the contractor. A truck owned by defendant company had an overweight hauling permit granted by the state. Overloaded, its weight caused the temporary bridge to collapse. The construction contract was so worded that the bridge belonged to the state while it was in use, although the contractor was bound to repair the damage. Was the contractor entitled to reimbursement for the cost of repair against the owner of the truck?*

THE ANSWER: No. (Forcum-James Co., Inc. v. Duke Transportation Co., 93 So. 2d 228, decided by the Louisiana Supreme Court.)

The court said that the contractor could not sue for damage to state property. The decision was influenced by Louisiana statutes and does not necessarily reflect what the courts of other states might decide in a similar case.

Computing penalty for delayed completion

THE PROBLEM: *A building contract provided for a $25 daily penalty for delayed completion beyond a fixed date. Could the job be regarded as substantially complete when most of the tenants, who were to occupy the building, moved in?*

THE ANSWER: Yes. (Connell Construction Co. v. Phil Dor Plaza Corporation, 302 S. W. 2d 724, decided by the Texas Court of Civil Appeals, Waco.) The court cited a decision by the Texas Supreme Court that a per diem penalty for delay is payable only to the time of occupancy, if the owner occupies before completion. (Collier v. Betterton, 29 S. W. 467.)

Employer was not liable when employee drowned

THE PROBLEM: *A construction employee was riding a boat provided by his employer to reach his place of work on a river bank. To cool off, the employee dived from the boat to swim to the bank but drowned before reaching shore. Was the employer liable to employee's dependents for workmen's compensation on a theory that the drowning occurred in the course of employment?*

THE ANSWER: No. (Collier v. Texas Construction Co., 90 So. 2d 390, decided by the Mississippi Supreme Court.)

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Voids in precast slabs are formed by Sonoco's low-cost

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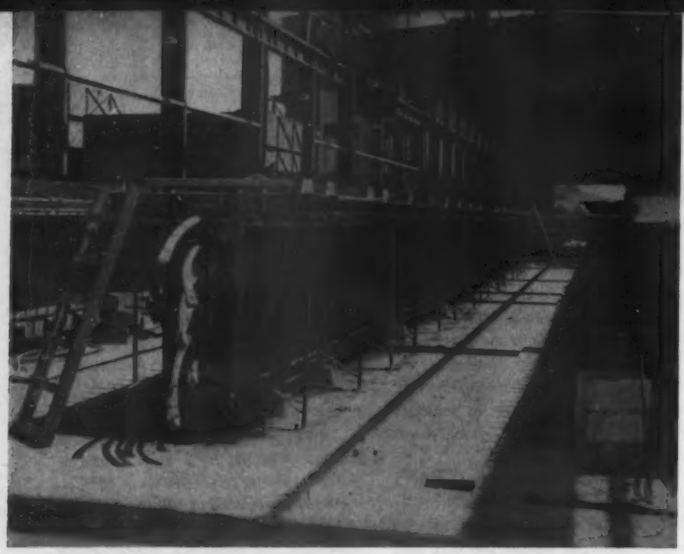
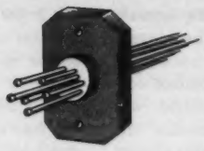


The big 80-foot-long prestressed girders for the highway bridge at Hercules, Calif., at the casting yard. An overhead crane handles the forms, concrete buckets, and reinforcing cages.



Prestressed girders roll into place on beam rails

Special dolly permits heavy bridge girders to be placed with minimum interference to road and rail traffic below

by RALPH MONSON, field editor

A sturdy dolly riding the flanges of a pair of heavy steel beams carried 39-ton prestressed concrete girders into place to form the deck of a new highway bridge at Hercules, Calif. The project was part of a $7 million contract for the relocation of highway U. S. 40 near the south approach to the new bridge being built across Carquinez Strait.

Heavy traffic on two railroads and a busy highway made it impractical to raise the girders by conventional

A three-axle Mack truck with a close-coupled tandem-axle trailer under one end hauls the completed 39-ton prestressed girder from Napa to Hercules. The other end of the girder was carried on a 16-wheel heavy-duty dolly, lashed securely in place. The girder is 46 inches high, the top flange 50 inches wide.

After the truck delivered the girder to the abutment of the bridge, a motor crane lifted one end of the girder off the truck and set it on the dolly which rides two I-beam rails across the span. Another crane, below the bridge, stands ready to pick the beam off the rail dolly when it reaches the pier. With this method of erection, traffic is still permitted to use State Route 4 underneath the bridge.

The top flanges of a pair of 36-inch WF steel beams serve as rails for the wheels of two rail dollies which ride across spans between the piers. In this case, a second rail dolly was substituted for the road dolly so that the girder could be brought into position.

After the girder has been rolled across the span, the motor crane prepares to lift the girder off the dolly and to the deck timbers. When the beam rails have been removed, the girder will go into the place the rails now occupy. ►

methods and led general contractor McCammon-Wunderlich Co., Palo Alto, Calif., to use the rolling system. The new structure overpasses the main line of the Santa Fe Railroad serving the San Francisco area, a narrow-gage railroad of Hercules Powder Co. used for hauling explosives from a nearby plant to storage areas in the hills, and four-lane State Route 4. These could not be closed for extended periods, and placing girders from the ground would have been a slow operation with many interruptions.

A secondary factor which influenced the choice of placing equipment was the height of piers, which ranged up to 64.5 feet. Big cranes and long booms would have been required to make the lifts safely, and the soft swampy ground under several of the spans would have created additional problems.

After completing the piers and abutments, McCammon-Wunderlich sublet the job of placing the girders to Dalzell Rigging Co., Emeryville, Calif. Dalzell also transported the girders from the casting plant of the Basalt Rock Co., Napa, Calif., to the job site.

To haul the 80-foot-long, 39-ton girders over the highways from Napa to Hercules, Dalzell used a big Mack three-axle truck with a close-coupled tandem-axle trailer under one end of a girder. The other end was lashed securely to a 16-wheel heavy-duty dolly.

Dolly carries girder

The basic idea used by Dalzell was to start from the abutment at one end and roll each of the prestressed concrete girders for the first span into place. These girders were then planked over and the delivery trucks brought the girders for the second span out as far as the first pier. Here one end was placed on the dolly and the girders were rolled ahead until this end was over the second pier. This erection operation continued across the length of the bridge.

A pair of 36-inch WF steel beams was set in place across the first span. The top flanges of these beams served as rails for the wheels of the dolly which rode across the spans between piers. The steel beams were moved

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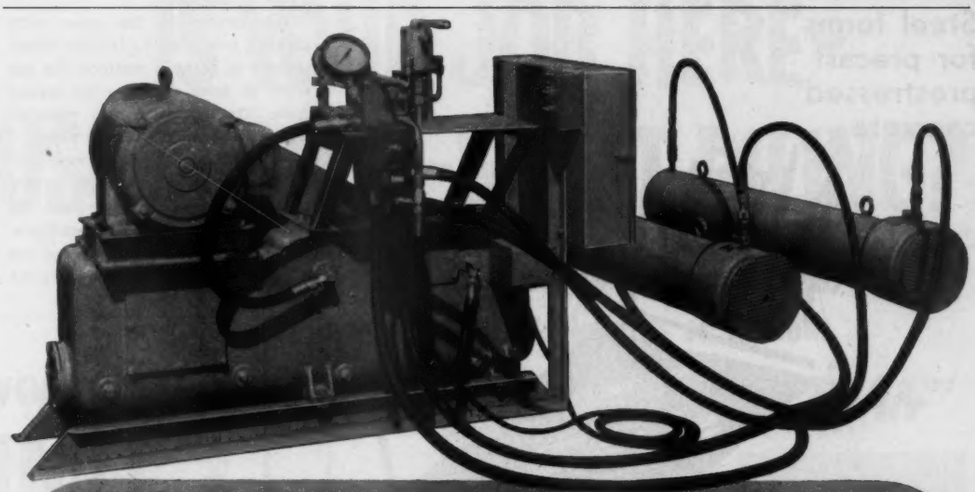

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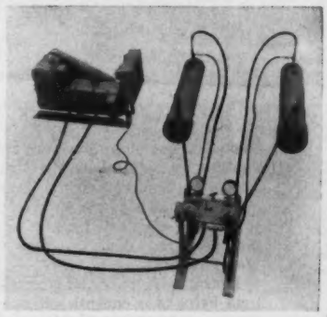

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(Continued from preceding page)

ahead by cranes as the work progressed.

A truck delivering a girder drove up the approach grade to the abutment of the bridge. A motor crane picked one end of the girder off the truck and set it on the dolly resting on the steel beam rails. The rubber-tire road dolly was left attached to the other end of the girder, and a line from the crane was carried through a snatch block on the pier to pull the girder and dollies straight across the span.

When the girder had been rolled across the span, two 30-ton motor cranes picked it off the dollies and set it in place on the bearing plates. The operation was repeated for each girder of the span.

The girders in this span were planked over with 6×14-inch bridge timbers to make a platform for the truck to drive ahead to the second span. The operation was repeated until all 136 girders were in place.

With this method, there were only short traffic delays while the girders were actually being lifted from the dollies to the bearings. At other times, the traffic on both railroads and the highway was only slowed down by the usual slow orders in any construction area.

Make 6-lane highway

The structure at Hercules is a part of the new alignment of U. S. 40 being built through the rugged hills between Richmond and Carquinez Strait. The realignment, which eliminates many curves and heavy grades, will lead directly to the new $23 million bridge presently under construction across the Strait.

The Hercules bridge is actually two bridges side by side, each providing a 40-foot roadway to make a potential 6-lane highway. Between the two roadways is an 8-foot-wide concrete median raised 6 inches above the bridge pavement. On the outside are 2.67-foot-wide concrete curbs surmounted by concrete rails. One of the bridges has eight spans while the other has nine.

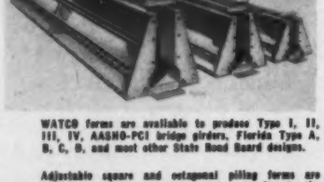
The 15 piers and two abutments, founded on 424 Raymond concrete piles averaging 40 feet long, were driven by a Raymond crawler rig. Concrete footings cap the piles and provide the base for the high T-shaped piers. The pier columns measure 3×14 feet in section, with

Steel forms for precast prestressed concrete

Just issued! This catalog describes the most complete line of steel forms available. Forms are fully illustrated and described, specifications are complete to enable the producer or engineer to accurately plan for efficient production. Many leading prestressing firms use WATCO forms to produce a great variety of uniformly accurate concrete sections. Precise fabrication and prealignment prior to shipment assure perfect fit when installed. Obtain a copy of this new WATCO catalog. Use it to plan your plant for superior precast prestressed concrete production.

WATCO forms are available to produce Type I, II, III, IV, AASHO-PCI bridge girders, Florida Type A, B, C, D, and most other State Road Board designs.

Adjustable square and octagonal piling forms are offered to produce precast or prestressed piles in the 12" to 24" range.



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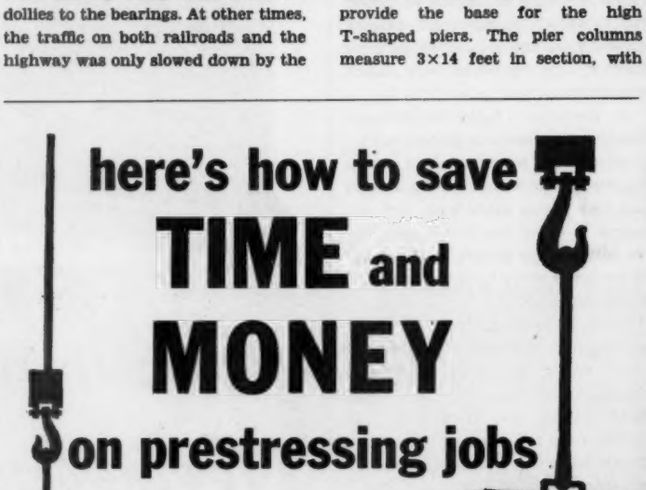
here's how to save
TIME and MONEY
on prestressing jobs



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Learn more today how our complete line of prestressing products helps you control schedules—how our top-quality products are competitively priced, royalty-free. For a free copy of our products catalogue, just write, wire or telephone:

INTERCONTINENTAL EQUIPMENT CO., INC.
Prestressed Concrete Division
120 Broadway, New York 5, N. Y.

Member Prestressed Concrete Institute

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The heavy equipment can use the bridge deck though the closing strips have not been cast. The scaffold overhanging the bridge, center, is for the workmen inserting the transverse post-tensioning rods into the diaphragms.

the T-caps widening out to 42 feet and tapering from 4 to 8 feet in height.

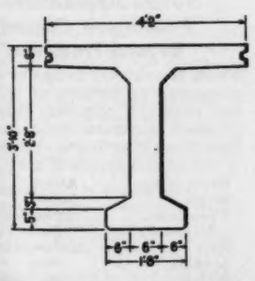
To cast the pier columns and heads, which were identical except in height, McCammon-Wunderlich designed and fabricated several sets of steel-framed forms. The column forms were framed with double channel wales ranging from 6 to 15 inches, inside of which were vertical 6-inch I-beam studs at 24-inch centers. The form was sheathed with 2×6 wood lagging and lined with ⅝-inch plywood.

Special bolts in the corners held the sides firmly together during concrete placing, and also provided a quick and convenient separation for releasing the forms and raising them to the next position. The forms, used to cast all of the pier columns, were supported vertically by Superior coil ties cast into each lift as the piers rose.

Coil ties, cast into the columns to support the head forms, also were framed of steel and lined with wood and plywood. Three sets of soffit forms and two sets of side forms were used. The sides were stripped on a 5-day schedule with the soffit forms remaining in place 14 days after casting.

Girders built in plant

The big prestressed girders were built at the Concrete Products Division of Basalt Rock Co., Napa. The girders for this structure, approximately 80 feet long, weigh about 39 tons each. They are built in a T-section with a 50-inch-wide and 6-inch-deep top flange. The web is 8 inches thick, and the lower flange is 20 inches wide tapering from 5 to 7 inches in height. The over-all height of the girders is 46 inches.



The post-tensioning is accomplished with seven 1⅛-inch-diameter Truscon Stressteel high-tensile bars. At the ends of the girder, these bars are distributed through the web.

(Continued on next page)

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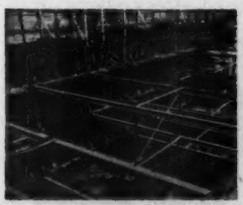

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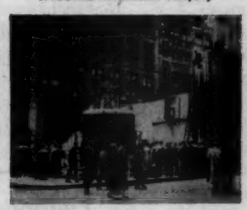

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The northbound bridge in the background has nearly all of the girders in place, while only the first 3 spans of the southbound bridge have been placed. At left is State Route 4; the Santa Fe railroad tracks are at far right.

Cammon-Wunderlich designed a form to hold the grout in place as the beam was set. The form was light enough to compress as the girder was set, yet strong enough to hold the grout in place and provide a perfect seat for the girder.

Building deck

When the girders were set, all that remained to be done was to cast the 18-inch-wide slabs between the girder flanges. The reinforcing dowels for these slabs were left projecting from the beam flanges. The contractor designed a simple form which could be pulled up into place with ropes and stripped after the pour without using any falsework or scaffolding under the bridge deck.

This form consisted of ⅝-inch plywood backed by two longitudinal 2×4's along the edges. Short cross 2×4's at 2-foot centers were fitted with long she-bolts. These extended above the deck to supporting 2×4's spanning the gap between girder flanges. One she-bolt at each end of the form was fitted with an eye for the rope raising the form.

The forms were made ready on the ground and raised into place with the rope. After the forms had been anchored in place, the eye-bolt was replaced with a standard she-bolt, and a metal sleeve was inserted to reattach the eye-bolt for lowering. When the section had been cast and cured, the eye-bolt and rope were replaced, and the form was lowered back to the ground. Scaffolding or work was not needed under the deck.

(*Continued from preceding page*)

As they near the center of the span, the higher bars dip down to the bottom concentrating practically all of the steel in the small lower flange.

Basalt Rock prefabricated the reinforcing cage, including conventional and post-tensioning bars. The latter were enclosed in 1⅜-inch flexible metal tubing to prevent bond with the concrete. The cages were set into place in the steel form by two overhead bridge cranes which serve the casting shop.

Two sets of steel side forms and 12 steel soffits were made for the girders. Two girders were cast per day. The concrete was prepared in an open pan-type mixer with revolving arms that resembles a gigantic food mixer. The 7.5-sack mix with ¾-inch-maximum aggregate was designed for a minimum strength of 5,000 psi in 28 days. With accurate control and steam curing it was possible to obtain 4,500 psi in three days.

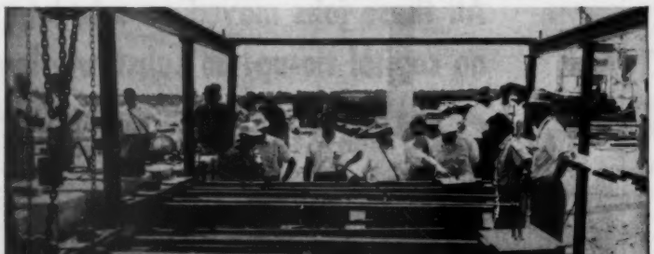
The concrete was handled in shop-made buckets by the overhead cranes. The forms were vibrated by external vibrators mounted right on the steel sides, while Vibro-Plus internal vibrators were used in the fresh concrete. Steam curing was started immediately after the completion of a pour.

When the concrete had attained 4,500 psi, usually within three days, the prestressed steel was tensioned. Hydraulic jacks applied the tension to the bars, which were anchored by Truscon Stressteel steel wedge and cone anchorage devices. The remaining space between the bar and the sheath was then pressure-grouted. From this point, Dalzell Rigging Co. took over the transportation and erection of the girders.

Although Dalzell used a number of truck cranes at the bridge site to place the beams, not more than three were used at a time. Among those used were a 35-ton P&H, a 30-ton Lorain, a 30-ton Insley and a 25-ton Bay City. Two of the cranes lifted the girders, but three were sometimes used to avoid repositioning the girders after they had been rolled across the span.

One end of each girder was set on a bearing plate. The other end was set in ½ inch of grout on a small concrete pedestal on the pier. Mc-

This Amazing Prestressed Concrete Industry



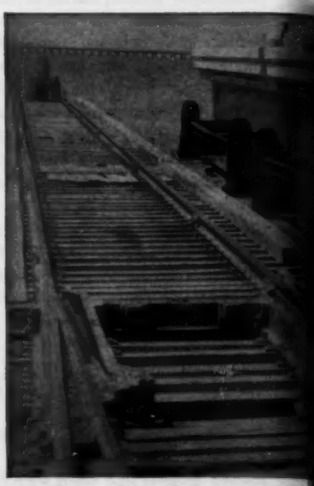
What Is Behind Its Phenomenal Growth?

This is a question which has been asked many times. Union Wire Rope Corporation has answered with the sound reasons for venturing a huge capital investment in expanded facilities and in research to master the technical know-how of producing prestressed, stress relieved, high tensile wire and strand. Without this key element prestressed concrete would still not be possible and practical.

To check our own reasons and to develop all of the fundamental facts responsible for the spreading use and acceptance of prestressed concrete,

We Asked A PANEL OF PIONEERS In the Prefabrication of Prestressed Concrete Members To Summarize the Facts Which Has Enabled Them To Maintain a Yearly Growth of 200 to 300 Percent.

What follows is straight from the horse's mouth. It is a summary of the fundamental facts contributed by a sizeable group of prestressed fabricators and consultants. All are pioneers who have had a part in the development of prestressed concrete and experienced its growth from a trickle five years ago to become the building material to be reckoned with by every factor in the building industry.



Here Is a List of Prestressed Products Which A PANEL OF PIONEERS Are Prefabricating

Girders

Roof Slabs
Regular, Lightweight, Lift, Channel, Thin shell, Hollow centers, Composite.

Beams
Joists
Trusses
Columns

Piles and Caps
Foundation, Marine, Fender

Lintels
Wall Panels
Siding
Posts

Pavements
Highway, Airport

Stadium
Framing, Seats

"Future Applications of Prestressed Concrete Beyond Prediction"

These are the words of one and the consensus of opinion of others on our panel of pioneers. Other prestressed concrete products mentioned as either being prefabricated or tested and proposed are:

Missile Wings
Barges
Transmission Line Supports
Piers
Seawalls
Wharfs
Arches
Skews
Spring Board—For Swimming Pools
Off-shore Drilling Piles
Platforms

While some of these may seem novel, many will become commonplace. Prestressing concrete for barges, for example, could very well become an industry in itself as is the prefabricating of bridge members.

As the deck was being cast, post-tensioning rods were inserted in the diaphragms spanning between the girders. These 1⅛-inch bars were post-tensioned by a crew from Basalt Rock Co. using a truck-mounted scaffold which overhung the side of the bridge to give the workmen access to the ends of the bars.

The median strip between the two roadways was then placed with a winch-pulled slip-form device riding on a guide and grade strip, and vibrating and finishing the concrete as it was pulled along. The reinforced-concrete median spans between the two bridges. On one side it is doweled rigidly to the concrete deck, and on the other side it rests on a sheet of Celotex to provide for possible movement.

The roadways will be paved with asphaltic concrete to complete the structure.

McCammon-Wunderlich's job is under the over-all supervision of project manager Sam Martinelli with Ralph McCall supervising the work on structures. Ted Johnson was bridge foreman and Kenneth Haddox concrete foreman. Project engineer for the contractor is John Beale. Harold Price is manager of the Structural Concrete Products Division of Basalt Rock Co., Inc. Paul Dalzell is president of Dalzell Rigging Co.

Representing the Division of Highways of the California Department of Public Works is resident engineer Frank White. Bridge representative for the highway department was Gerald Oliver. THE END

Engineers report on roof collapse to concrete group

On August 30, 1956, a section of roof collapsed on the newly completed Blanckner Elementary School, Orlando, Fla. Immediately all concerned with the structure—the architect, School Board, general contractor, and concrete fabricator—agreed that an investigation should be undertaken by competent professional engineers. The investigating board included H. Ross Bryan, consulting engineer, Nashville, Tenn.; H. H. Edwards, president, Leap Concrete, Inc., Lakeland, Fla.; and Professor A. M. Ozell, college of engineering, University of Florida, Gainesville, Fla.

The engineers have completed their investigations and presented the report to the Prestressed Concrete Institute. The men found that the collapse was not caused by ultimate failure of the slabs; the design of the roof slab was defective in that the extreme fiber stresses exceeded those allowed; and the cracking of the slab resulted in excessive deflection and the ponding of water on the roof which brought about more deflection and also rotation of the slab at the supports.

The engineers also found that the bearing points of the slab on the concrete block wall were eccentric and the wall design was inadequate; and the rotation of the slabs shifted the bearing point causing the wall to collapse.

PANEL OF PIONEER Prefabricators Cite These Outstanding Prestressed Concrete Advantages...

1. Fully Utilizes Two Inherent Strength Factors

Prestressing combines and enhances the inherent characteristics of two of the foremost construction materials—

A. The compression strength of concrete with

B. The high tensile strength of stress relieved cold drawn steel wire and strand.

2. Basic Economy

A. Steel for prestressing is six times stronger than ordinary steel but only approximately 3 times more costly.

B. Concrete for prestressing is twice as strong but only 10 to 20% more costly than ordinary concrete.

C. Prestressing consumes less steel and concrete to attain equal or greater structural strength more economically.

3. Structural Balance

A. In prestressed concrete, stresses and strains are balanced to produce structures whose deflections are under definite control.

B. Cracks, otherwise unavoidable in concrete, are eliminated by prestressing.

4. Design Economy

A. Prestressed concrete makes possible thinner sections, lower depth to span ratios, longer cantilevering without ballast beams and reduction in weight. All of these factors enable the designer to effect savings in foundation, in columns, in wall height or to convert head room into usable cubage.

B. Steady progress in standardization of sections under the auspices of the Prestressed Concrete Institute is making prestressed concrete more and more versatile from the standpoint of designers.

5. Prestressing Is Pre-Testing

A. Because they are subjected to greater loads in fabrication than is imposed upon them in the field, precast, prestressed members are in reality pretested.

B. Produced by factory methods, under closely controlled conditions, prestressed concrete guarantees the designer structural performance to meet or better expectations and affords relief from extensive supervision and inspections.

6. Stock Pile Availability

A. Factory line production methods with time saving devices insures delivery of prestressed concrete members from the production line in step with contractors work schedules.

B. Production of prestressed sections proceeds at top speed, affording maximum utilization of labor and stockpiling against projected construction.

C. Prestressed concrete eliminates construction delays by by-passing materials in short supply or on extended backlog delivery.

7. Speeds Up Construction

A. Construction by the older, conventional methods involves both erection and fabrication on the job site.

B. The latter is accomplished much faster in central plants or on the site mechanized plants and the resulting prefabricated units are erected with clock-like precision.

C. Often it is possible to complete structures in half the time required by conventional methods. It is often possible to erect prestressed concrete in the time required to make, place and shore up forms for poured in place concrete.

8. Permanence of Concrete—Plus

A. Well known is the durability of concrete. Well known too is its vulnerability to cracking. Cracks lay it and its reinforcing open to deterioration.

B. Prestressing makes concrete a flexible material with the ability to withstand extraordinary deflection and recover without cracking.

9. Insurance Savings

Comparison of insurance premiums are reported on new buildings with prestressed concrete roofs as against old buildings with wood roofs. Roughly the yearly premium on the latter is more than for 5 years on buildings with prestressed roofs. Though this is a comparison of extremes, it is indicative of how prestressed construction is regarded by insurance companies.

10. Economy of Maintenance

A. Even in marine construction or in construction subjected to other extreme corrosive conditions, the cost of maintenance on prestressed concrete construction ranges from nil to the expense involved in painting in cases where color is desired.

11. Widely Competitive

A. The initial cost of prestressed concrete is such as to enable its prefabricators to successfully bid against the permanent, fire resistant, all-weather types of construction in many types of structures.

B. When the collateral economies effected by prestressed concrete, such as greater and more flexible strength for longer spans and fewer columns, balanced stresses and strains and controlled deflection, thinner sections, lower depth to span ratios, lower wall heights and increased usable cubage, ready availability, speedier erection, negligible maintenance and lower insurance premiums are considered, then the competitive edge is definitely on the side of prestressed concrete for a growing list of structures.

So goes the summary of the thoughts of a panel of pioneers except for a warning which was sounded: Be sure of adequate capital and technical guidance when venturing into the business.

Stress-Relieved Wire & Strand For Prestressed Concrete 4

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2260 Manchester Avenue Kansas City 26, Missouri

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Third volume out on civil engineering

"American Civil Engineering Practice", Volume III, edited by Robert W. Abbett, is now available from John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. This volume discusses the theory of structures, masonry and plain concrete, reinforced concrete, and prestressed-concrete structures.

Other topics developed are footings, piers, and abutments; retaining walls, steel bridges, reinforced-concrete bridges; buildings; timber structures; steel construction; and earthquakes and earthquake-resistant design. Formulas, graphs, diagrams, tables, and charts supplement the written material. The price is $25.

Story of structural steel developed in new film

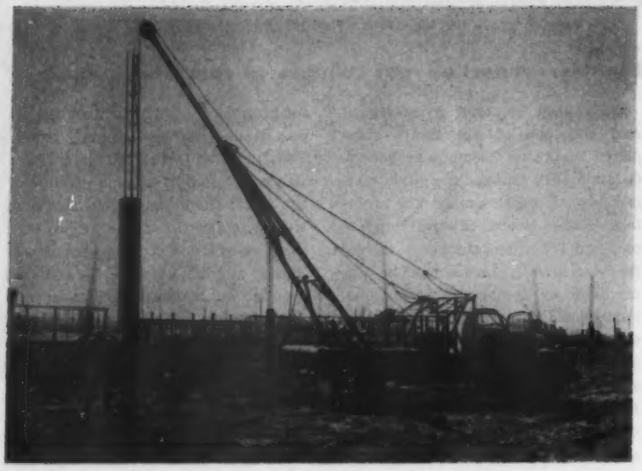
"Skylines" is the title of a 16mm, sound-color film from the Bethlehem Steel Co., Bethlehem, Pa. The half-hour film dramatically portrays the role of structural steel in building the skylines of today. It also tells the history of structural steel.

Other concepts of steel are described—bridges, buildings, schools, and modern shopping centers. Requests for copies of the film should be made at least three weeks in advance.

Copies will be loaned from the Publications Department, Bethlehem Steel Co., Bethlehem, Pa.; or from Bethlehem Pacific Coast Steel Corp., Publications Department, 20th and Illinois Streets, San Francisco 19, Calif.

Aberthaw Construction elects vice president

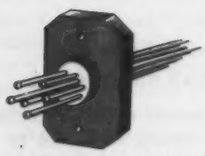
David O. McKinley has been elected vice president of Aberthaw Construction Co., Boston, Mass. McKinley joined the firm in 1955, and has since served as chief estimator. He previously worked with Charles Logue Building Co., and Turner Construction Co.



Reinforcing steel for the interior columns is set with the help of a GMC winch truck with a Braden single-drum winch. The cage is threaded through the 8-foot-long steel pipe on the ground, and both are set as a unit.

Prestressed beams, roof slabs keep warehouse job on time

Subcontractor produces average of 5,000 square feet of roof slabs, 120 linear feet of beams daily for 650,000-square-foot facility



(Additional photo on front cover)

Swift pouring and curing, and efficient handling of prestressed roof slabs that span 49 feet between prestressed beams are speeding construction of a giant warehouse at Will Rogers Field, Oklahoma City, Okla.

The $11 million, 650,000-square-foot warehouse and shops building is one of eight structures being constructed to house the new headquarters and training facilities of the Civil Aeronautics Administration. This West Point of the C.A.A. will, for the first time, bring scattered units together into one aeronautical center. It will provide uniform training for C.A.A. employees engaged in airways and aircraft safety activities throughout the U. S. and foreign countries. Under construction by the Oklahoma City Airport Trust, the facilities will be leased to the C.A.A., which has the General Service Administration acting as administrator.

The designers and supervisors of the project are Hudgins, Thompson, Ball & Assoc., Oklahoma City. The general contract, scheduled for completion in July, 1958, is held by Dan Tankersley & Assoc., a joint venture made up of Tankersley Construction Co., Oklahoma City; Cowen Construction Co., Shawnee, Okla.; Metropolitan Paving Co., Oklahoma City; and Tecon Corp., Dallas, Texas.

The warehouse, the only aeronautical center building of prestressed-concrete design, will be 1,001 feet

Cut Rod, Wire

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MANCO HYDRAULIC GUILLOTINE

Ideal for use in Pre-Stressed Concrete Work

You can't match a Manco Hydraulic Guillotine for ease and speed of cutting heavy wire and reinforcing rod. From 10 to 65 tons cutting thrust is developed in these relatively portable tools . . . bites right through rod and wire in as little as ¼ second per cut. Three models available with maximum capacities of ½", 1" and 1¼".

Manco model MC 210 Hydraulic Guillotine illustrated above has a ½" maximum capacity. Requires only ¼ second per cut. Complete Manco power operated hydraulic unit includes cutting head, motor, pump and pump reservoir.

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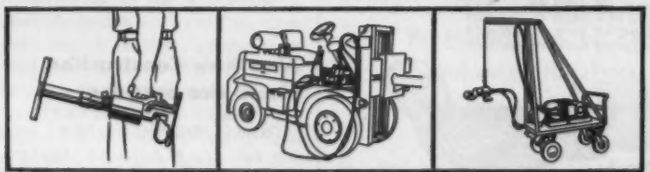

Model MC-35 with integral hand pump. Manually operated completely portable. 1" capacity.

Lift truck mounted Guillotine Cutter and hydraulic booster pump utilizes truck hydraulic system. Cutter will cut 1" rod in 1 second.

Manco Guillotines can be daily mounted for portability. Motor can be electric or gasoline. Cutting head is mounted on spring tension balancer.

Write For Catalog . . . Dept. CE-9

MANCO MFG. CO. *Bradley, Illinois*

For more facts, use Request Card at page 18 and circle No. 239

ECONOMY STEEL FORMS

FOR PRECAST PRESTRESSED CONCRETE

Visitors at the recent World Conference on Prestressed Concrete in San Francisco saw all steel prestressed girder forms similar to the above in use at Basalt Rock Co., Inc. plant at Napa, Cal.

Girders cast in these forms are being used on bridges designed by the state of California, Division of Highways.

For information and quotations on all types of precast forms, call or write:

ECONOMY FORMS CORPORATION

Box 128, H.P. Station

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Sales offices coast to coast

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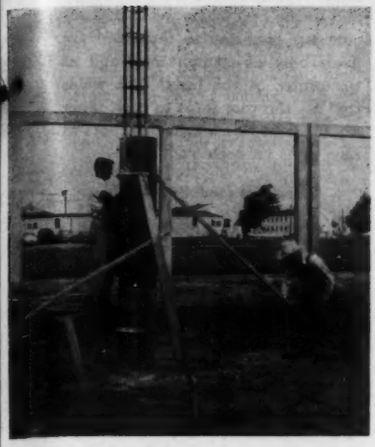

Concrete having been poured to within a foot of the top of the pipe sleeve, workmen strip the 2×4's providing four-way bracing. The pipe sleeve is supported on 10-inch legs that allow the pipe to be adjusted to exact grade.

A Challenge 6-yard mixer on an International R-190 truck chutes ready-mix concrete to a Gar-Bro ½-yard bucket for a top lift on one of the 18 to 22-foot columns. Dolese Concrete Co., Oklahoma City, is supplying the concrete for the job.

Men on Safway scaffolding trip the bucket and handle the Stow vibrator that consolidates the mix, while a transit setup is used to check the alignment of the column.

long and 650 feet wide. About 90 per cent of the building will be used to store parts for Instrument Landing Systems and similar installations; the remaining 70,000 square feet will be devoted to a shop maintenance area.

The unloading of trucks and railroad cars at the warehouse will be a relatively simple operation, since the concrete floor rests on a fill about four feet higher than the outside ground. The fill is enclosed by a 5-foot-high grade beam, which rests on a footing supported by drilled piers and belled footings. The interior columns of reinforced concrete are also supported by drilled piers with belled footings. In general, the columns are on 33-foot centers running north and south for the length of the building and on 50-foot centers running east and west. Prestressed, inverted T-beams span the 33 feet between the north-south col-

(*Continued on next page*)

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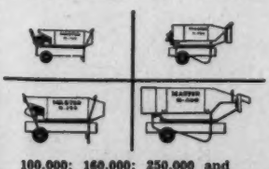

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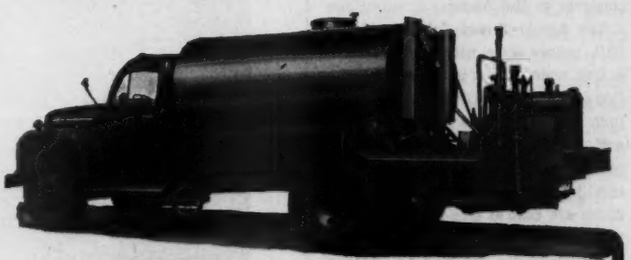

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Crews use the Safway scaffolding again to strip the Deslauriers column forms. These are in a continuous section from the top of the first lift to the top of the column. Hinged collar clamps on about 2-foot centers give strength to the form.

(*Continued from preceding page*)

umns. The 50-foot east-west span is of prestressed double-T roof slabs.

Casting yard

Prestressed members for the structure are being cast and stockpiled at a yard about five miles from the job. Thomas Concrete Pipe Co., Oklahoma City, which has the subcontract for furnishing and erecting the beams and roof slabs, is able to stay ahead of the big contract by producing 5,000 square feet of roof slabs and 120 linear feet of beams per day.

Concrete for the beams contains Type I cement with a crushed limestone and sand aggregate. The aggregate, charged to Heltzel bins, and the cement, stored in a Boardman 600-barrel-capacity silo, is mixed in a Construction Machinery Co. 2-yard mixer. It dumps to a shop-made concrete bucket that rides rails to deliver concrete to the forms.

The double-T roof slabs are 48 feet 10½ inches long with a top section 4 feet wide and 2 inches thick. The two joists, each containing four 7/16-inch wire strands, are 12 inches deep and spaced 2 feet apart. Welding plates are cast in the bottom ends of the joists, and side welding anchors are cast at one-third points on the edges of the slab. The side welding anchors tie one slab to another, and the welding plates at the bottom ends of the channels tie the slab to the beam.

When the slabs come off the casting bed, they are curved like an archer's bow. Under their own weight they have 2½ full inches of camber, and under normal roof load the camber is 2 inches. This camber, which increases the strength of the slab, is attained by locating the center of gravity of the steel below the neutral axis of the concrete member. The strands are depressed about 3 inches at two points—5 feet on either side of the center of the slab.

A tension of 18,900 pounds per strand, applied by hydraulic rams, is released after about sixteen hours, when the concrete has reached a 3,500 psi. The fast cure on the lightweight concrete is attained by a high early-strength portland cement and by radiant steam heat in the casting bed. The 8½-sack mix contains an expanded shale aggregate.

The inverted T-beams, also cast in the yard, have a cross section that permits the joists of the slabs to rest on a ledge and the top of the slab to remain flush with the top of the beam. Of the 36 strands in the beam, 24 are depressed about 6 inches and pulled to 18,900-pound tension.

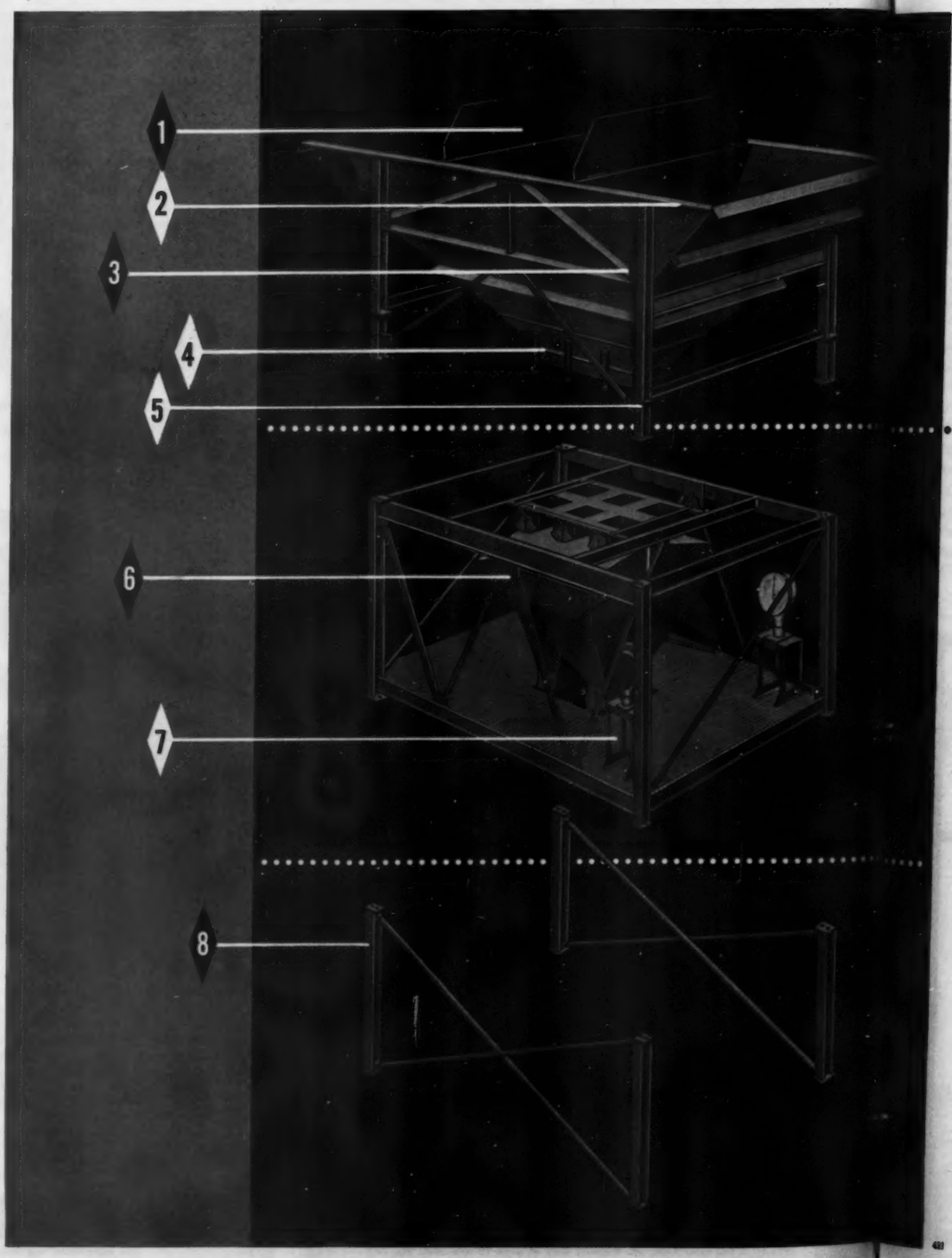
Erecting beams, roof slabs

Flat-bed trucks and specially designed pole trailers haul the prestressed members to the job site. The beams, which weigh as much as 17,000 pounds apiece, are picked up from the truck and set in place by a Lima 25-ton motor crane. The ends of the beam are grouted to form a tie with the columns.

The double-T roof slabs are then placed side by side, with their ends seated on the ledges of the north-south beams. After the slabs are in place, they are welded to each other and to the beam. The welds that secure the roof slab to the beam are made only at column lines and at the center of the beam. The welds that tie the roof slabs to each other are made at side welding anchors at four spots on each slab.

Electrical conduits on roof

The roofing that tops the slabs is unusual in that it contains the electrical wiring for the warehouse. This use of the clear expanse of the top of the roof cuts down on the number of junction boxes needed. The electrical conduits will be covered with a 2½-inch layer of Vermiculite concrete. The layer will serve as roof in-



sulation and also provide a smooth surface for the four plys of felt and tar.

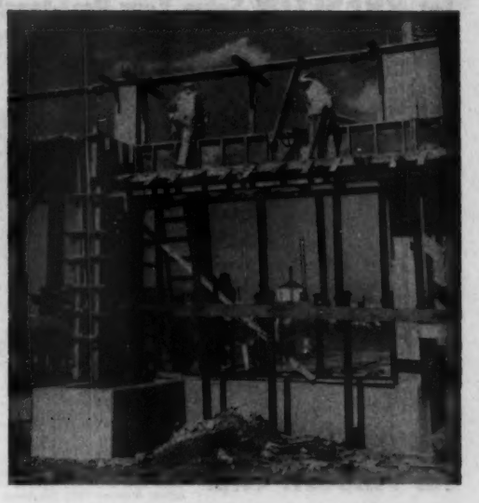
Forming and pouring columns

Columns, which vary in height from 18 to 22 feet, contain an 8-foot-high protective pipe at the base. The steel pipe is used in forming the first lift, and it becomes a permanent part of the column.

Setting up the reinforcing steel is the first step in building the columns. Aided by a GMC winch truck equipped with a Braden single-drum winch, workmen thread the cage of column steel through the 8-foot length of pipe and set the section upright on the drilled pier and belled footing. The bottom of the pipe is then set to the grade of the finished concrete floor, which is about ten inches above the top of the pier. The pipe is supported by three adjustable legs, made of bolts screwed into nuts that are welded on the inside bottom of the pipe.

Deslauriers column forms close the gap between the bottom of the pipe and the pier. The column form is then braced four ways by 2×4's and poured to within a foot of the top of the pipe.

The forming of the second lift of the column is simplified by lightweight Deslauriers forms of No. 18-gage steel. These are continuous for the height of the pour and include the haunch section at the top of the column. Wedges hold the two half-sections of the form together, and hinged collar clamps, approximately on two-foot centers, give the long, lightweight form strength and rigidity. The height of the second lift varies from 10 to 14 feet above the first lift of 8 feet.



Supports are set for the beam bottom of a 14 × 16-inch roof beam on an inside truck well. Ellis shores and clamps support the conventional plywood frame.

Concrete for the columns, supplied by the Dolese Concrete Co., Oklahoma City, arrives at the job in Challenge 6-yard mixers mounted on International R-190 trucks. A motor crane with a 75-foot boom and a 15-foot jib buckets the concrete from one position to eight of the column forms. As the pour advances from column to column, the crane picks up a Stow vibrator driven by a Wisconsin engine and places it on the Safway scaffolding of the next column to be poured.

The heavy rains that bogged down construction in all parts of the midwest this spring also caused delays on this project. The fill enclosed by the grade beam collected rain water that was impossible to drain. When the operation was not shut down because of rain, men and equipment were slogging through the sticky mud. In spite of these delays, construction of the warehouse, which started in February of 1957, is expected to be completed in March.

Safety in design

Fire protection for the warehouse is provided by the 16-inch fire walls of expanded shale block that divide the building into seven areas. Additional protection is provided by an automatic overhead sprinkler system. For the storage of flammable goods, a specially built corner area with a pan-type, reinforced-concrete roof is available. Any explosion that might occur will be directed away from the building by weakened exterior walls. The ordinary exterior walls are of face brick, backed by expanded shale block.

A mile-long railroad spur, being constructed under this contract, will allow freight cars to unload alongside the warehouse. The unloading facilities include two 4-position truck wells, 3 inside truck docks, and 6 truck ramps. Hydraulic truck lifts for servicing fork trucks are being furnished by the Rotary Lift Co., Memphis, together with self-leveling hydraulic dock ramps. Oil hydraulic

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(Continued from preceding page)

freight elevators, primarily for moving personnel and test equipment to the antenna testing station on the roof are being supplied by Elevator Service Co., Fort Worth.

Personnel

D. K. Andrews, Jr., project engineer for Hudgins, Thompson, Ball & Associates, spends a considerable amount of time on the job, coordinating the activities of the owner, the contractor, the C.A.A. and the G.S.A. In charge of inspection for the architect-engineer is W. P. Lindsay.

Dan Tankersley is the representative for the contractors in the joint venture, and his general superintendent is C. O. Turrentine. J. T. Wyatt is building superintendent.

F. M. Lanter is director of the Aeronautical Center, and the construction management engineer for C.A.A. is John W. Gregory, Jr. Sid Rudin is G.S.A. resident engineer. Trustees of the Oklahoma City Airport Trust are William Gill, Jr., and Philip J. Rhoads. THE END

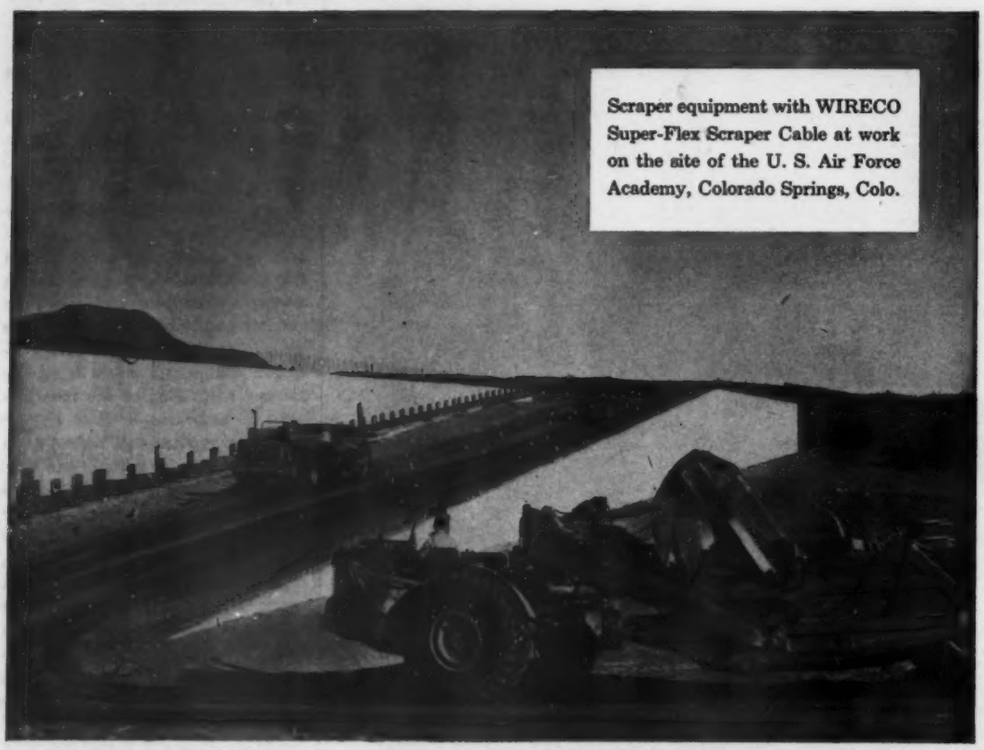
Manufacturers exhibit prestressing products at World Conference

Some 30 exhibitors displayed their products for the 1,500 delegates attending the first World Conference on Prestressed Concrete, held last month at the Fairmount Hotel in San Francisco.

Among the products exhibited were metal and rubber forms, special vibrators for compacting the concrete in the thin and congested prestressed sections, and equipment for mixing and handling the concrete. Other exhibitors displayed the special steels used for prestress reinforcement, including wire rope, cable, rods, and attachments. Also in evidence were the machines and devices for actually applying the stress to the steel.

With prestressing people thinking especially about high early strengths, the producers of chemicals and products which aid in curing and in attaining the high strengths found their booths well patronized.

All of the exhibitors are making literature on their products available to engineers and contractors unable to attend the conference. Some of the literature is described in this month's Product Literature section starting on page 161. All of the exhibitors are also listed on this page. A quick and easy way to get literature from any of them is by circling the proper number on the Request Card at page 18.



Scraper equipment with WIRECO Super-Flex Scraper Cable at work on the site of the U. S. Air Force Academy, Colorado Springs, Colo.

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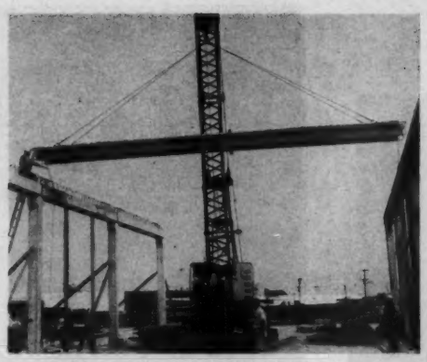

LIGHTWEIGHT CONCRETE is chuted (extreme right) from a transit mixer to forms for pretensioned roof panels that will be used on the General Electric Lamp Division offices and warehouse building in Los Angeles, Calif. Panels and roof girders are being pretensioned at the site by a joint-venture, Noyes Roach Co., and C. L. Peck, both of Los Angeles, Calif. Four panel beds and one girder bed are used to produce 28 roof panels and 7 girders every three days for the million-dollar structure. Twelve pretensioning wires are being used in the girders, eight in the roof panels. Above, a Lorain crane lifts the first of the 496 roof panels into place on the prestressed girders.

National Wage Chart shows prevailing trade pay

A 1957 National Wage Chart, showing hourly wage rates of building mechanics in more than 140 principal cities in the United States and Canada, has been published by the Builders Association of Chicago.

The chart covers wages of asbestos workers, bricklayers and masons, carpenters, glaziers, hoisting engineers, ornamental and structural iron workers, lathers, marble setters, painters, pipe and steam fitters, plasterers, plumbers, roofers, sheet metal workers, stone cutters, and tile setters, among other trades.

The chart provides information on the hourly work week of each of the trades in the various cities, and also indicates trades having welfare and pension benefits in certain locations.

Copies of the chart are available at $1.50 each and may be obtained from the Builders Association of Chicago, 228 N. La Salle St., Chicago 1, Ill.

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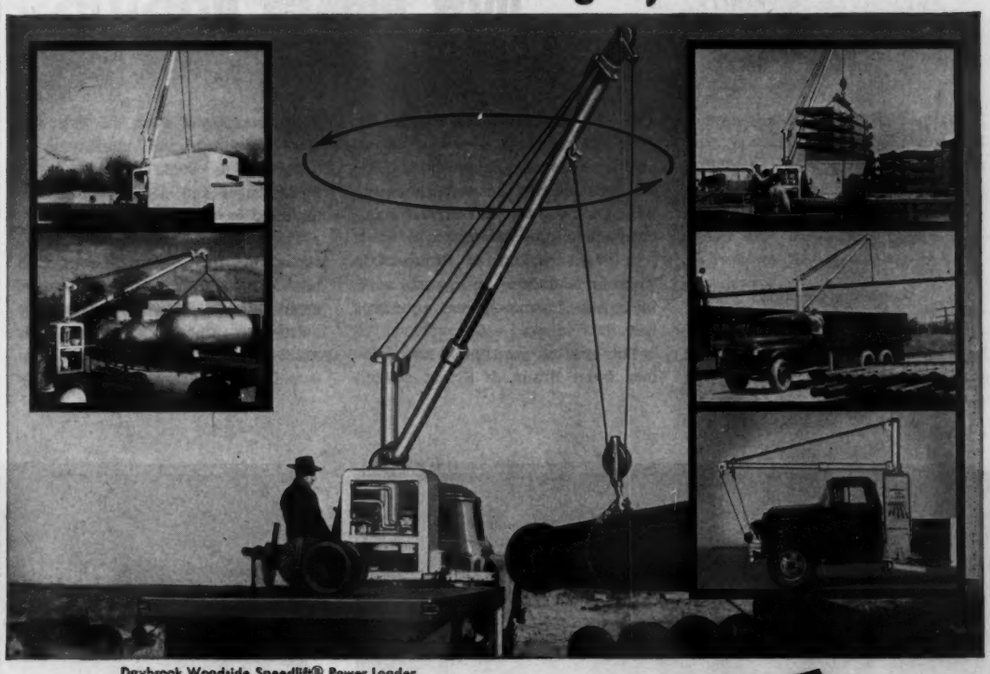

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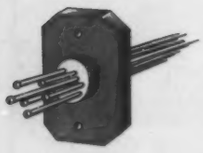
Big is the word for Brann & Stuart's prestressing operations. Workmen are preparing for a pour in one of the double-tee alleys, which are partly covered by an abandoned railroad building. The dead ends of the prestressing beds are in the foreground.

A closer view of the dead end of an alley shows only three strands per stem being used for a pour. The maximum is seven strands per stem. Side boards enclose the Food Machinery forms, and prevent the escape of heat supplied by the circulating hot oil lines which can be seen at left.

Contractor turns producer; now makes prestressed components



An old and reputable contracting firm has started a new and profitable venture as a supplier of prestressed-concrete units. After examining the potential market and many commercial prestressing yards for a few years, Brann & Stuart Co., Trenton, N. J., went into prestressing in a big, expensive, and confident way.

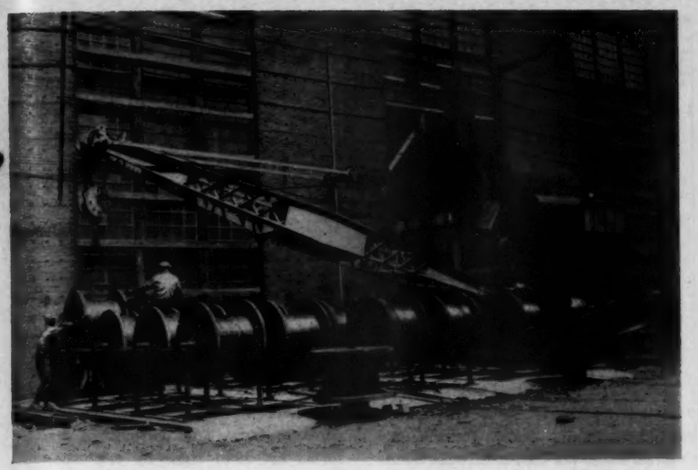
The existing yard, built last summer when Brann & Stuart started this new phase of work, was designed large enough so that alterations in existing beds would not be needed when longer and stronger prestressing members are called for.

The design of the beds, and supervision of their construction, was handled for Brann & Stuart by one of the country's leading prestressing authorities, Charles C. Zollman & Associates, Newtown Square, Pa. The entire plant consists of four double-tee alleys on two beds, and two universal alleys on a single bed. All six alleys have an effective working length of 305 feet, allowing Brann & Stuart to produce 1,220 linear feet of double-tee slabs and 610 linear feet of different size beams.

The universal bed is capable of stressing up to 160 strands, or 80 strands per alley, making it one of the largest in operation. Over 600 cubic yards of concrete was required

Behind the jacking or live ends of each alley are two reels of Roebling pretensioning strands, one for each double-tee stem. This allows a workman to pull two strands—one for each double-tee stem—to the dead end of the alley. This end of the bed is housed in the abandoned railroad building.

Ready-mix concrete is chuted to the Food Machinery double-tee forms by a Jaeger mixer on an International truck. The man on the forms is using a Stow vibrator to consolidate the concrete in the stems. Other workmen use a company-built screed equipped with a Vibro-Plus electric motor to surface-finish the concrete.



Outside the building housing the universal beds, one of the yard's two Ohio Locomotive 40-ton cranes positions a reel of Roebling cable in the 26-reel rack. The cranes, riding tracks that connect with a Pennsylvania Railroad spur, also transport completed units to freight cars.

Pretensioning strands from the reels pass through wall openings to the universal beds. In the foreground is the control panel which operates the four 200-ton hydraulic jacks used to tension the strands in each alley.

Universal beds, with two alleys, are among largest in operation; both double-tee and universal alleys have working length of 305 feet

by ANTHONY N. MAVROUDIS,
field editor

to form each of the 30-foot-deep abutments on either end of the universal bed. The casting-bed slab, supporting the two alleys between the end abutments, is 12 inches thick and 22 feet wide. Two 36 WF 280 steel sections about 30 feet long were embedded in the concrete abutments to form the uprights at the ends of the universal alleys.

Each double-tee alley, having a maximum capacity of 14 strands, or 7 strands per stem, is equipped with a full set of Food Machinery steel forms bolted to the 12-inch casting-bed slab. Each of the two beds, supporting two double-tee alleys, has four 1-inch-diameter supply and return lines to heat the forms. The supply line runs the entire length of one side of a double-tee stem and the return line runs on the other side of the stem. Circulating hot oil is used to heat the forms.

A Hopkins Volcanic oil and gas burner is used to supply the circulating oil through the double-tee beds. This procedure not only hastens the concrete-curing process but also makes it possible for the temperature of the oil to be raised up to 300 degrees during the winter months to keep pours from freezing. The double-tee pours are also covered with wet burlap during the overnight curing cycle.

Both the double-tee and universal beds are housed in two abandoned buildings sold to Brann & Stuart by the Pennsylvania Railroad. One building completely houses the universal bed; the other building partially covers the double-tee beds.

Stressing operations

A total of 40 reels of Roebling 7-strand, cold-drawn, stress-relieved pretensioning strands are mounted

Two wide-flange steel sections are embedded in the concrete abutment at the jacking or live end of the universal alleys. Europa strand vises hold the strands in the template, which is braced against the jacking frame. The Rodgers jacks that tension the strands will be replaced by mechanical struts to maintain elongation.

This beam being formed in the universal casting bed calls for Sonovoids to be placed above the pretensioning strands. The ready-mix concrete supplied by Warner Central-Mix Concrete Co., Morrisville, Pa., is chuted to the bed by a Jaeger mixer on an International truck. Mall vibrators consolidate the material.

(Continued from preceding page)

on racks in the yard between the buildings. There are 26 reels mounted adjacent to the universal bed building and 14 against the double-tee building. The 14 reels are mounted on a movable rack that rides on rails. This makes it easy to position the reels directly behind any one of the four double-tee alleys. Right now, this system is being revised so that the 14 reels will be able to supply strands to the universal beds, together with the other 26 reels.

Pretensioning strands for the universal alleys are passed through openings formed in the wall of the building, threaded through a jacking template, and fastened to a steel template. Europa strand vises are used to grip the strands to the pulling template. All 40 strands required for an alley are attached to the pulling template and simultaneously pulled the length of the bed.

An air hoist, located at the dead or opposite end of the universal bed, can handle the pulling of the template for either alley. The air winch is located between the two alleys and, through a block and tackle assembly behind each alley, can pull the template of either alley after a pulling cable has been passed through the desired assembly. A Link-Belt crane is used in the universal building to support the strand template being pulled from the live to the dead end of the bed.

The dead end of each alley consists of separated vertical steel plates supported between top and bottom cross beams attached to the wide flange uprights. Once the template reaches the end of the alley, the top cross beam is removed and the template dropped behind the vertical plates. This allows the strands to fall and pass into the spaces between the plates. The top cross beam is then replaced and bolted to the uprights. An initial pull of 1,000 pounds is applied to each pretensioning cable by means of the air hoist and a cable passing through the block and tackle assembly. The load is measured by a dynamometer inserted in the cable line between the hoist and the strands. The initial load makes the strands taut and removes any kinks or irregularities in them. After the initial load has been applied, the Europa strand vises are readjusted to maintain the load. This completes the operations at the dead end of the alley.

Hydraulic jacks used

Four Rodgers 200-ton hydraulic jacks are then placed at the live end of the alley by an overhead hoist. Welded brackets support them between the steel uprights and the movable jacking frame which holds the strands with Europa grips. The jacks, powered by a Rodgers electric motor, then apply the stressing load simultaneously to elongate the strands about 23¾ inches.

The jacks can be removed for work on the adjacent alley after they have been replaced with mechanical struts which maintain the elongation. The moving of the jacks and the handling of the struts is another job for the overhead electric hoist.

The Food Machinery side forms, held in place by steel brackets bolted to the casting-bed slab on 30-foot centers, are oiled before concrete pouring starts. During this phase of the work the tops of the side forms are held in place by adjustable spreader bars. The bottoms of the forms are held tight by oak wood wedges driven between the bolted

CONCRETE TESTING AT THE JOB SITE

Where roads, bridges or buildings are under construction, the new, portable CT-711 CONCRETE TESTER is an invaluable aid in saving time, money and materials . . . by bringing laboratory testing precision to all working locations.

CUBES • CYLINDERS • BEAMS
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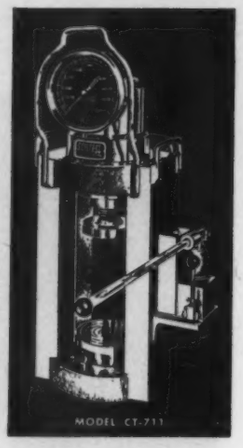

SOILTEST Incorporated

EASTERN OFFICE: 60 EAST 42nd STREET
NEW YORK 17, N.Y. PHONE YUkon 6-7383

4711 WEST NORTH AVENUE • CHICAGO 39, ILLINOIS

For more facts, use Request Card at page 18 and circle No. 249

STOW DEVELOPS TWO NEW PRODUCTS FOR PRECAST WORK

POWER MIDGET VIBRATOR

The manufacturers of precast concrete products have long needed a vibrator head "to work in the narrow forms we use" . . . a head about 1½" in diameter. For a long time it was thought improbable that a head *this* small could really do any work.

Now, Stow Manufacturing Co. has developed a vibrator with a 1¼" head that really packs a wallop. It is powered by a ½ HP universal motor, with trigger switch, which drives the head at 12,000 VPM. Thoroughly field tested, the Power Midget is ideal for precast work, perfect for any job where narrow forms are required (bank vaults, manholes, etc.).

TWIN BEAM VIBRATING SCREED

In addition to the Power Midget Vibrator, Stow Manufacturing Co. has developed and thoroughly tested this revolutionary machine for striking off thin precast slabs: a vibrating screed with *two* beams. *Working with this Twin Beam Screed gives the effect of making two passes at once.* The vibrating head transmits the vibration evenly to both beams. Thus as the screed is worked along, the first beam strikes off the concrete, while the second beam gives the concrete a final finish! For more information on the Power Midget Vibrator, or the Twin Beam Screed, contact your Stow Distributor. In most cities, you'll find him listed under "Concrete Vibrators" in the yellow section of your telephone directory. Or, if you prefer, send in the coupon below.
For complete information on Vibrators, Screeds, Roto-Trowels, Concrete Grinders, write for Stow Catalog 560.

STOW MANUFACTURING CO. 40 Shear Street, Binghamton, N. Y.

Please send me literature and specifications on the Stow Power Midget Vibrator and the Twin Beam Screed.

NAME .....
COMPANY .....
STREET .....
CITY ..... STATE .....

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- **POWERFUL** 83 lbs. on lever* produces 3,000 lbs. at hooks. *1½ ton model.
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The "CM" Puller will do a "thousand-and-one" jobs for you. It will do them faster, safer and far easier. The "puller" is compact... stores conveniently in a tool box. Lifetime lubricated. Every contractor should have one.

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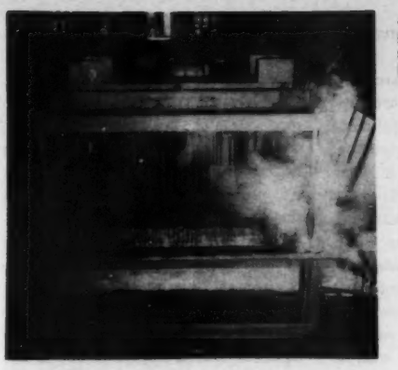
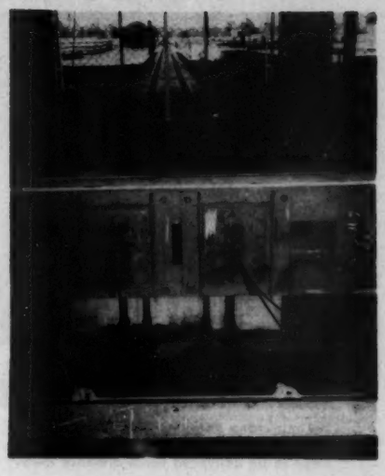


At the dead end of the universal alley, the template holding the strands is braced against vertical steel plates supported by top and bottom cross beams. Europa strand vises hold the strands.



The three strands being used for this pour pass through the jacking template of the double- tee alley. Between the two uprights in back of the protective screen and the jacking frame itself are the two hydraulic jacks that apply tension to the strands.

steel slab brackets and the form base.

Ready-mix concrete, purchased from the Warner Central-Mix Concrete Co., Morrisville, Pa., is chuted to the universal bed by Jaeger mixers on International trucks. Mall electric vibrators consolidate the concrete around the strands, Sonovoids, and other reinforcing steel. Most of the top reinforcing steel going in one of these beams is prefabricated in the same building and placed as a single unit. This feature of the plant reduces the time required to shape and place reinforcing bars directly inside the forms.

After the concrete has been placed and hand-finished, burlap covers are laid directly over the concrete within the forms. This is done to absorb any condensation formed during the steam-curing process and to prevent the formation of laitance on the surface. Tarpaulins are then placed over the wood cribbing which spans the spreader bars on the forms.

Along both sides of each alley are two 2-inch-diameter steam lines—a main feed line and a perforated line that allows steam to escape under the tarps through drilled holes spaced on 4-foot centers. Live steam passes into the perforated lines through three equally spaced valves on the main feeder lines. The three valves break each perforated line into four sections.

Using this feature, Brann & Stuart can begin steam curing as soon as the first quarter-length of the alley has been poured. Steam is introduced into succeeding quarters as they are completed; there is no steam loss through uncovered lengths of pipe. Concrete test cylinders, required to determine the strength of the poured concrete, are placed on top of the wooden cribs and covered with tarps to be steam cured the same as the prestressed beams.

Steam supplied by a Clayton steam generator located outside the dead end of the building is maintained to assure a concrete temperature of 130 to 140 degrees for a maximum of 36 hours. The length of curing time is generally specified by the company's customers, who also specify the required concrete strength after curing. A 4,000-psi strength after 16 to 18 hours of steam curing is generally desired. The company rarely lets concrete strength get that low; units average close to 5,000 psi after the required curing time.

When the specified strength has

(*Continued on next page*)

ONE MAN
White
VIBRATOR

Write for prices and specifications on America's safest, easy-to-handle vibrators with 115 volt AC-DC motor in head. Also new HI-CYCLE model . . . and flexible shaft models, electric or gasoline engine.

WHITE MANUFACTURING CO.
Elkhart 9, Indiana
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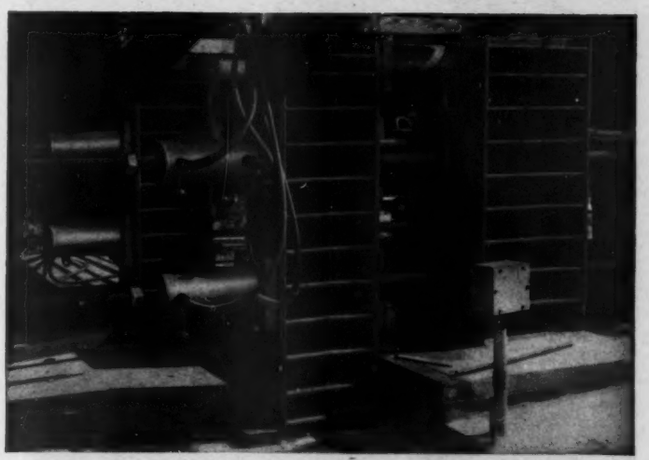
How to Simplify Rigging for Concrete Tensioning Beds



This concrete prestressing bed is equipped with four "Re-Mo-Trol" 100-ton center-hole hydraulic rams operated by an electric pump at 10,000 P.S.I. The rams are mounted on steel frames to which the wire strands are anchored. Note pull-rods through Center-Holes of rams. Holding tension on rods by means of lock nuts at end of ram travel permits resetting for additional "bites"... permits unlimited travel range. (*Photo Courtesy of Good Stone Mfg. Co. Inc., Rochester, N.Y.*)

Simplex Hydraulic Pullers Provide Portability and Unlimited Travel; Make Load Spacing and Balancing Easy

Pre-tensioning and post-tensioning concrete is simple and efficient with Simplex Hydraulic Pullers. Simplex Center-Hole construction permits power to be applied in *direct-line* pull through a ram to eliminate eccentric loading. At the same time, rigging is simple and economical because complicated back-up devices are not needed.

LOCKING PULL-RODS PROVIDE UNLIMITED TRAVEL

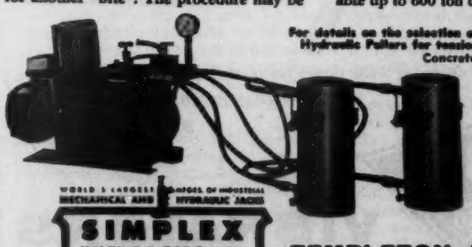
With the Simplex System, pull-rods go through the Center-Hole of the Puller and are attached to the pulling tangent holding the wire strands. The puller, braced against a stationary mount, moves the rods and tangent forward with direct, uniform pull. Unlimited travel may be obtained by locking the threaded pull-rods in tension with a lock nut after the full stroke of the ram is completed. The ram is then reset for another "bite". The procedure may be repeated as often as necessary, limited only by the length of pull-rods used.

LIGHT WEIGHT UNITS ARE EASY TO MOVE AND PLACE

Two or more pullers may be mounted to handle any installation for the production of Double-Tee, Slab or Channel members in permanent beds or at the job site. The relatively light weight of Simplex units permits easy movement from one bed to another and easy alignment for proper spacing. This provides self-equalizing, uniformly balanced pulling of either single or multiple strands or cables.

Simplex "Re-Mo-Trol" units consist of High-Pressure Rams actuated by hand, air, electric or gasoline powered pumps. Standard rams with 10" stroke are available in 60 and 100 ton models and with 22" stroke in a 100 ton model. Special units are available up to 600 ton capacity.

For details on the selection and application of Simplex Hydraulic Pullers for tensioning concrete, write for Concrete Bulletin.



2 100-ton Simplex "Re-Mo-Trol" Center-Hole Hydraulic Rams actuated with Electric Powered Pump. Note 2 Shut-off Valves for manually controlling even travel of the 2 Rams.

WORLD'S LARGEST MANUFACTURERS OF INDUSTRIAL MECHANICAL AND HYDRAULIC JACKS
SIMPLEX JACKS

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For more facts, use Request Card at page 18 and circle No. 253

A Lima crane handles beams in the storage yard. Trailer trucks haul the shorter prestressed components to nearby sites. Long units, or those that have to be delivered some distance away, are transported by rail.

(Continued from preceding page)

been reached, the strands are detensioned. The side forms are released first, then the hydraulic jacks are replaced. The jacking procedure is reversed gradually until all the prestressing load on the strands is released. On the universal beds, detensioning can only be done after the side forms have been released and stripped away from the concrete beams. The strands between the bulkheads, which form beams of varying lengths in an alley, are cut with a torch after the strands have been detensioned.

Double-tee beds

Two Roebling reels of pretensioning strands have been installed at the jacking end of each double-tee casting alley. As there is only a 7-strand maximum required for each double-tee stem, Brann & Stuart have found it simpler and faster to pull the strands manually, rather than with a mechanical device. The company is also thinking of mounting another two reels at each dead end of the alleys. This way, the workman pulling a strand from the jacking end to the dead end for each of the two double-tee stems can pull another two strands on his return trip.

An initial load of 1,000 pounds is also placed on each strand by a ratchet wrench equipped with a dynamometer for measuring the load. Reliable strand vises are used in the double-tee setup to fasten the strands to the jacking frame and the dead-end template. Two Rodgers 150-ton hydraulic jacks are used to stress the strands by elongating them about 22½ inches.

The Food Machinery double-tee forms are oiled with Poco soluble compound, mixed at a ratio of 3 parts water to 1 part compound, before the ready-mix concrete is placed. Stow electric vibrators are used to consolidate the concrete in the stems, and a company-rigged vibrating screed, powered by a Vibro-Plus electric motor, is used to surface-finish the double-tee slab.

Side boards, installed along the outside of the forms, enclose the circulating oil lines adjacent to the steel forms. As in the universal casting bed setup, the oil is heated to give the concrete a temperature of 130 to 140 degrees while it is curing. Pours are covered with wet burlap and allowed to cure overnight. After the concrete cylinder has been tested, the strands detensioned, and the strands between the bulkheads cut, the double-tee slabs are picked up by two Ohio Locomotive 40-ton cranes.

The cranes ride on rails running alongside the double-tee beds and the universal beds. The rails also have a direct connection with a Pennsylvania Railroad spur that is used when prestressed slabs or beams have to be transported a long distance or when they are too long for shipment by trailer truck.

Brann & Stuart, with room for future expansion in the two buildings, is presently working on a method of pretensioning draped strands. This involves a problem that many organizations are now trying to solve. The difficulty arises not in the pretensioning of the strands—for hold-down devices have been developed to maintain the draped, curved alignment of the strands—but in the detensioning phase. It has been found that the prestressing load cannot be removed by detensioning from only one end of the alley. The member has to be detensioned simultaneously from both ends to keep members from jackknifing and to provide uniform pre-

Powerful small diameter vibrators for prestressed concrete

TO SOLVE the problem of consolidating low slump concrete in narrow, constricted areas, Viber offers these powerful, small diameter vibrators.

In addition to outstanding performance, they combine lightweight and compact design, making them remarkably easy for operation by one man.

Model 11A, weighing only 17 pounds, is amazingly effective for a unit of such small diameter. It is ideal for slip-form work and indispensable for use in constricted areas where standard vibrators are impractical.

Model 26, a full-powered small diameter vibrator is available with extended lengths of flexible drive. Head is interchangeable with Model 11A. It is especially popular in prestress manufacture because the small diameter head operates with great effectiveness in constricted, hard-to-reach places. Equipped with 4 feet of drive it weighs 37 pounds.

Tip of vibrator housing is replaceable. Viber's patented rubber tip furnished unless steel specified.

Contact your nearest dealer or write direct for further information and prices.

VIBER COMPANY, 726 South Flower Street, Burbank 24, California

VIBER CO

VIBRATORS

Pioneers and leaders in the manufacture of vibrators.

For more facts, use Request Card at page 18 and circle No. 254

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Suction • Water • Steam Air • Multi-Purpose Discharge • Pile Driver

Wherever your job is—*whenever* you need hose—there's a Continental Warehouse nearby stocked to give you any kind of hose you want—*when* and *where* you want it.

There's no need to wait for distant shipments—no need to stop the job—no need to lose profits.

Any time you need hose call Continental. You'll like the fast service and dependable quality you get from these warehouses:

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DETROIT 27, Mich. 13801 Schoolcraft Ave.
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MEMPHIS 3, Tenn. 268 Madison Ave.
NEW YORK 7, N. Y. 81 Murray St.
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Continental Suction Hose is recognized nationally by contractors for its superior quality—not an ordinary hose, but a hose built for rugged, dependable service. Sizes 1½" through 12", for water and/or sand suction. Send for catalog of HOSE and PROTECTIVE CLOTHING.

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"Well, if you don't want the tractor, how are you fixed for blades, windshield washer, lighter fluid, household oil, gum, or shoe laces?"

Text contains practices and pointers on rigging

A second edition, revised, of the "Handbook of Rigging", by W. E. Rossnagel, is a practical manual of rigging practices and pointers for construction and industrial work. The book shows the reader how to handle every step in any rigging operation from erecting a swinging scaffold and painting a steel jack to operating a hoist or using a hydraulic jack.

The book includes formulas used in calculating the strength of hoisting tackle, beams, and posts. It also contains data on safe loads on wire rope and chain, the effect of defects on the strength of timbers, reference codes, laws, and standards relating to rigging and hoist signals.

Priced at $6.50, the book may be purchased from the publisher, McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36, N. Y.

(Continued from preceding page)

stressing along the entire length of the alley.

Faith in the future of the construction industry prompted Brann & Stuart to expend huge sums to set up the plant. And their progressive leadership, plus the constant increase in the use of prestressed members, virtually assures the company of success in this relatively new and highly technical work.

Personnel

Frank Hackstaff is the plant superintendent, and Paul Henry, the engineer, for Brann & Stuart. R. D. McGilvra is the vice president of the company. THE END

Withdrawing a pile with a McKiernan-Terry E4 Pile Extractor hung from a steel strongback suspension that exerts downward pressure on the pile next to the one being removed. The cable strongbacks and a cable from the crossbar to a deadman give the unit additional strength. McKiernan-Terry Corporation, 82A Richards Ave., Dover, N. J.

For more facts, use Request Card at page 18 and circle No. 256

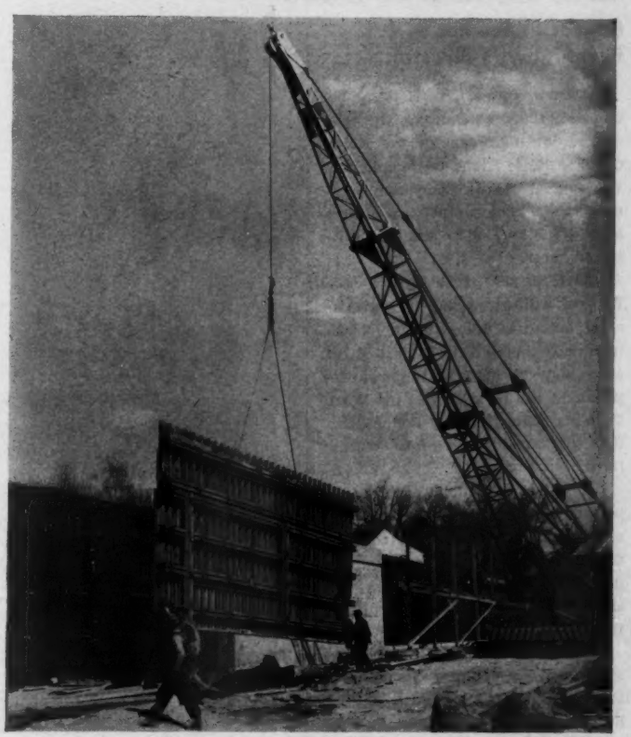
Walls, Slabs, Beams and Stairways Formed with Symons Forms

8,500 square feet of Symons Forms with steel cross members, 200 column clamps and 550 shores were used by Sullivan Long and Hagerty, Birmingham, Alabama, for construction of the new $6,000,000 Jefferson County (Birmingham), Alabama, sewage treatment plant, vacuum filtration and flash drying building, and six digester tanks.

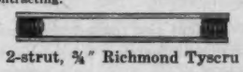
Forms were leap-frogged for successive lifts on the walls. Slab thickness ranged from five to seven inches and Symons 8-foot shores with 8-foot extensions on four foot centers were used to hold the slabs 23 feet high.

Symons Forms may be rented with purchase option. For more information on Forms, Clamps and Shores write for literature. Symons Clamp & Manufacturing Company, 4251 Diversey Avenue, Dept. J-7, Chicago 39, Illinois.

For more facts, use Request Card at page 18 and circle No. 257



Form being moved into position. Back wall form, reinforcing steel, Richmond Tyscrus, are all in place. After front form—which consists of two telescoped panels—has been set down, bolts connecting the panels are loosened so that upper panel can be raised and tilted by crane to required height and shape. Pre-cut plywood will fill gap between two panels. When form is positioned, workmen hook plank scaffolding to walers, fasten ¾" Richmond Tyscrus with seven or eight quick turns. Contractors: Corbetta-Yonkers Contracting.



2-strut, ¾" Richmond Tyscru

Pours Speeded with New Form Method and Richmond Tyscrus

Three miles of retaining walls were needed where the southern end of the New York Thruway cuts through Yonkers. No two sections of the wall are alike; they differ both in height and slope of coping. Corbetta-Yonkers speeded construction by a combination consisting of the use of ingenious telescoping panels fabricated at their yards — and 12,000 lbs. safe load (.340 HT Steel) Richmond Tyscrus for their assembly.

Assembling method is described above. The whole process took less than one hour. Stripping the form was just as easy, with the Tylag backed out of the form. Richmond Tyscrus helped cut costs in other ways too: their built-in extra strength (published load 12,000 lbs.; ultimate strength 20,145 lbs.) means that you can pour fast and heavy in all weather. There is only one threaded connection, with a coarse thread which is self-cleaning when removed from the concrete. Richmond Tyscrus are far more economical than conventional ties.

The new Richmond Handbook describes the full line of Richmond-engineered tying devices. Write for your copy. Or, if you have a specific concreting problem, Richmond's Technical Division or field men will be glad to submit recommendations, drawings and proposals. Write RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Avenue, Brooklyn 8, N. Y. or 315 South Fourth Street Saint Joseph, Mo.

For more facts, use Request Card at page 18 and circle No. 258

names in the news

Governor Luther H. Hodges, seated, with Willard F. Babcock, the first director of highways for the North Carolina State Highway Commission.

Babcock becomes N. C.'s first highway director

Governor Luther H. Hodges has named Willard F. Babcock the first director of highways for the North Carolina State Highway Commission. The 40-year-old transportation engineer was a civil engineering professor at the State College and a consulting engineer.

Under the new state highway act, Babcock will serve a five-year term as chief executive officer of the 9,000-man department. Also, as part of the state highway act, the highway department will be known as the North Carolina State Highway Commission, and the words "and Public Works" have been eliminated.

Babcock has announced the appointment of Godfrey E. Dixon to serve as the highway department's first controller. Dixon, a certified public accountant, has been in charge of the highway department's fiscal section since January of this year.

W. H. Rogers, Jr., was re-appointed state highway engineer by Babcock. Rogers has been directly responsible, during the past eight years, for maintenance and new construction on the state's 70,000-mile public road system.

Gov. Hodges also named seven new highway commissioners to replace the 14 commissioners under the old system. The new commissioners will tackle road problems at a state level and be an advisory group to Babcock. Col. William T. Joyner was named chairman of the new commission.

Sam Beard was named director of public relations for the department.

Steinman to receive medal from Franklin Institute

Dr. David B. Steinman will receive the Louis E. Levy Medal from The Franklin Institute of Pennsylvania for his paper on the design of the Mackinac Bridge for aerodynamic stability, which appeared in the Institute's magazine. The award will be presented at the Institute's annual medal day ceremonies on October 16.

The Levy Medal will be the fourth award Dr. Steinman has received for his design of the Mackinac Bridge.

N. J. Turnpike Authority has Morecraft as chairman

Joseph Morecraft, Jr., has been selected as chairman of the New Jersey Turnpike Authority, to succeed Paul L. Troast. The Turnpike Authority also has Angus M. Harris as new commissioner; and Cornelius E. Gallagher, vice chairman.

Morecraft was formerly treasurer of the Authority and is succeeded in that post by Harris.

White Engineering elects Buchanan vice president

Bruce Buchanan has been elected vice president of reports and appraisals of the J. G. White Engineering Corp., New York, N. Y. Buchanan succeeds Walter Carr who retired.

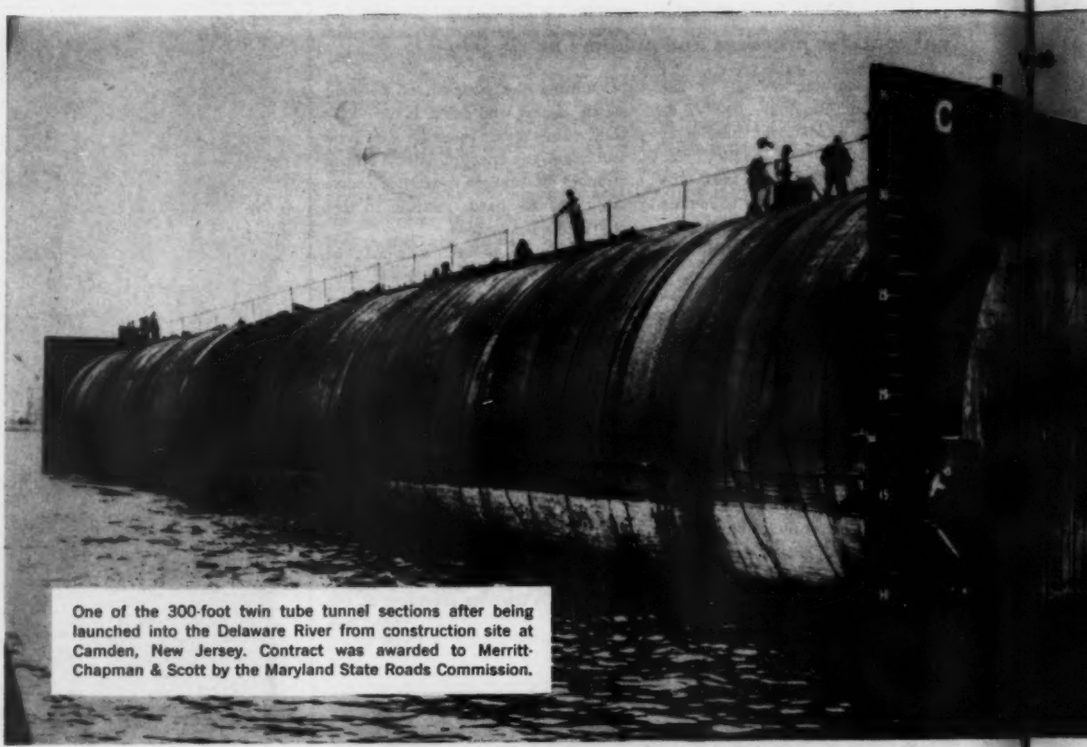
Buchanan has served as project manager for the firm's construction in Formosa, Turkey, and Brazil. He is a member of the American Society of Civil Engineers and is a licensed and professional engineer in New York and Michigan.

Mount Vernon Co. elects Bickelhaupt president

The Mount Vernon Co., Mount Vernon, Ohio, one of the oldest steel bridge building firms in the country, has elected Ivan A. Bickelhaupt president. He succeeds Clyde G. Conley, who was elected chairman of the executive committee. James G. Blessing, formerly a vice president of the firm, was elected executive vice president.

Ivan A. Bickelhaupt, new president of The Mount Vernon Co.

Bickelhaupt comes to The Mount Vernon Co. from the Pittsburgh-Des Moines Steel Co., which he served from 1914 to 1928, and again from 1951 until his election as Mount Vernon's president. In World War I, Bickelhaupt served with the U. S. Army Engineers, and in World War II, as a Lieutenant Commander, Commander, and Captain in the U. S. Navy Engineer Corps.



One of the 300-foot twin tube tunnel sections after being launched into the Delaware River from construction site at Camden, New Jersey. Contract was awarded to Merritt-Chapman & Scott by the Maryland State Roads Commission.

Gulf Products help avoid delays on

Here's a 6300-foot tunnel that was floated into position! It's a twin tube tunnel that will carry four lanes of traffic under Baltimore harbor, linking route U.S. 1 on the south with U.S. 40 on the north. Merritt-Chapman & Scott are the contractors on this 30 million dollar job.

The steel core of the trench-type tunnel is made up of 21 twin tube sections, each 300 feet long and lined with concrete. The sections are fabricated ashore, floated into position, sunk in a dredged trench and covered with backfill. Then watertight bulkheads are removed and interior work—tiling, lighting, road surfacing—is completed. The tunnel is 103 feet below the surface of the Patapsco River at its deepest point.

The steel tubes were fabricated under subcontract by Bethlehem Steel, Maryland Drydock Company and New York Shipbuilding Corporation, a subsidiary of Merritt-Chapman & Scott. Use of Gulf quality petroleum products on this job enabled the contractors to be sure of prompt deliveries, avoid mechanical delays and keep their

THE FINEST PETROLEUM

CONTRACTORS AND ENGINEERS

Corps of Engineers opens new Marine division

A Marine division has been established in the U. S. Army Engineer Division, North Atlantic, at 90 Church St., New York City, to effect a closer control on the widespread dredging activities of the Corps of Engineers. All operations—maintenance, repair, research, development, planning, and new vessel construction—will be coordinated by the new Marine division.

Clarence C. Burger of the office of engineers in Washington, D. C., has come to New York as a special assistant to Col. Clarence Renshaw, North Atlantic division engineer. His duties include establishing and supervising the new Marine division which is headed by Henry G. A. Hayward, who was chief of the Plant and Special Projects Branch of the North Atlantic division.

Krook vice president of Bechtel Corp.

Alfred T. Krook has been elected vice president of Bechtel Corp., San Francisco, Calif., and the firm's subsidiaries, Bechtel International Corp., and Canadian Bechtel Ltd. Krook will work with oil and gas developments in western Canada and northwestern United States.

Krook's professional experience in engineering and construction has been principally in the industrial, petrochemical, petroleum, and power fields.

A. E. Somerville, left, manager of construction operations, and R. G. Widman, assistant construction manager of Arthur G. McKee & Co.

McKee Co. promotes

A. E. Somerville has been appointed manager of all construction operations of Arthur G. McKee & Co., engineering and construction company of Cleveland, Ohio. With the McKee Company since 1940, Mr. Somerville has served as assistant construction superintendent, construction superintendent, general superintendent of construction for Metals Division projects, and assistant construction manager. He succeeds the late James H. Sharpe.

R. G. Widman, former construction superintendent for McKee, is now assistant construction manager. Mr. Widman joined the McKee firm in 1948 as a field engineer, and was promoted to construction superintendent three years later.

Founder of earthmoving firm honored at dinner

J. R. Sensibar, completing 50 years as founder and president of Construction Aggregates Corp., Chicago, Ill., was honored at a testimonial dinner by his employees and office associates. Sensibar and his father founded the Sensibar Sand Co. in 1907 for leveling the Indiana sand dunes in order to build the city of Gary.

Later, when supplying fill for the Museum of Natural History, Chicago, Sensibar developed a sand-fill method which consisted of using a dredge to suck up sand and water from the lake bottom and pump it into a diked area.

Personnel changes made in Corps of Engineers

Col. Alvin C. Welling has been assigned engineer commissioner for the District of Columbia by the U. S. Army Corps of Engineers. Col. Welling succeeds Brig. Gen. Thomas A. Lane who has been made commanding general of Fort Leonard Wood, Mo.

At the same time, Brig. Gen. William A. Carter, Jr., has been made president of the Mississippi River Commission. Nominated by President Eisenhower and confirmed by the Senate, Gen. Carter will also serve as Lower Mississippi Valley division engineer with headquarters at Vicksburg, Miss. He succeeds Maj. Gen. John R. Hardin who retired from active service.

The Corps also appointed Brig. Gen. Louis J. Rumaggi division engineer for the North Central division, to succeed Brig. Gen. P. D. Berrigan who retired. Gen. Rumaggi will have jurisdiction over district offices at St. Paul, Minn., Rock Island and Chicago, Ill., Detroit, Mich., and Buffalo, N. Y.

ASTM elects president and other officers

R. T. Kropf has been elected president of the American Society for Testing Materials at the organization's 60th annual meeting held in Atlantic City, N. J. Kropf will serve for one year.

Elected vice president was P. L. LaQue to serve for two years. K. B. Woods continues as vice president, an office he was elected to last year. Five directors were elected to serve for three-year terms: C. L. Clark, A. E. Juve, J. H. Koenig, R. E. Peterson, and R. W. Seniff.

Shape-up basin where sections are fitted with inner ring of concrete and roadway slab prior to being towed to position and sunk into the river bottom.

Southern end of tunnel in position on the river bottom and ready for road surfacing, tiling, and other final interior work.

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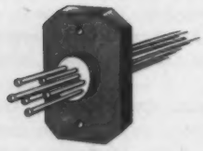
Five miles from the building site, men in John A. Denie's & Sons' casting yard set stirrups before forms are set to enclose the 18 strands of Roebling ⅜-inch wire. These are pulled to a 252,000-pound tension.

The I-beam-type girders are precast in Food Machinery Co. forms. Two Jackson electric vibrators consolidate the mix. The 3-yard laydown bucket riding a 10-ton overhead crane is fed by ready-mix trucks.



Prestressed beams support steel bar joists in roof of warehouse, office building

Rain and steel shortage demand unusual construction; floor of building is poured before roof is erected

The prestressing technique gained another adherent in Union Realty Co., a Memphis, Tenn., developer, despite some difficult job conditions on its 168,000-square-foot warehouse and office building in Frayser, Tenn.

Though the beams of the warehouse are of prestressed concrete, steel bar joists support the roof. Late deliveries on the bar joists made it necessary for the floor of the building to be poured before the roof was

by **BILL ALLEN,**
field editor

Deliveries of steel bar joists for the roof delayed, the contractor goes ahead with floor pours before the roof is erected. This Drott Four-In-One on an International TD-9 levels ground made muddy by rain.

◄ Ready-mix concrete, supplied by John A. Denie's & Sons Co., is chuted from a Jaeger 6-yard mixer to the floor. A wood screed resting on wood bars is used to work the concrete to grade.

Exterior walls go up as the floor is poured. The lightweight concrete block for interior walls, trucked to the site and unloaded to make pallets, is spotted for masons by a Minneapolis-Moline tractor with a fork lift. ►

erected. Enough rain fell during the job to bog down most operations, but using heavy track equipment to assist ready-mix truck and other rigs through the mud, the contractor kept the work moving.

Though Union Realty Co. has built many warehouses in this area near Memphis, the 465×360-foot warehouse, leased to Butler Brothers of Memphis for the south-central location for the Ben Franklin Stores, is the first to use prestressed beams. The results have been so favorable that Union Realty is now building a similar—but larger—warehouse. This firm is in the unique position of being the developer, designer, builder, and owner of the warehouse at 4183 Steele Road; it even owns the general contracting firm on the job, Commercial & Industrial Construction Co.

Casting yard

The 40-foot beams for the building were cast and prestressed at a commercial yard about five miles from the job. John A. Denie's & Sons Co., which operates the casting yard as well as the adjacent ready-mix plant and brick yard, held the subcontract for furnishing and erecting the beams.

The yard is equipped with a 50-foot-span, 10-ton overhead crane which carries a 3-yard laydown bucket to the forms. Ready-mix trucks from the adjacent plant feed the laydown bucket. Among the various types of casting beds are two 300-foot-long rows used for casting the I-shaped beams. Beams are 12 inches wide, 28 inches deep, and have a 5-inch web. Their lengths vary from about 32 to 40 feet. The bottom flange contains eighteen ⅜-inch strands of Roebling wire.

Prestressing was done with a Rodgers 100-ton jack, which pulled the strands to a total tension of 252,000 pounds. Workmen wired ⅜-inch reinforcing stirrups to the strands at varying centers, then set the steel forms. Concrete was poured either from the bucket on the overhead crane, or chuted directly to the forms by transit-mix trucks. Two Jackson electric vibrators were used to consolidate the mix. Efficient crews kept production at about 300 linear feet per 8-hour shift.

Denie used a 1-inch aggregate and a Type 3, high early cement furnished by Missouri Portland Cement Co., Memphis. The concrete reached a 3,500-pound test in 36 hours.

Flat-bed trailers, lengthened by means of a bolster, hauled the big beams to the warehouse. In hauling into the building, the rigs were often helped through the mud by a Cat D7 dozer. An American motor crane picked up the beams from the flat-bed and set them in place. The plates at the beam ends were later welded to the plates cast in the column tops.

The beams generally ran north and south between columns on 40-foot centers. The 30-foot east-west span was made entirely with steel bar joists resting on the concrete beams. The joists were welded to plates cast in the beam.

The joists support a Tomadek 20-gage metal deck made by Toma Machine & Supply Co., Memphis. The 20-year built-up roof is made of four layers of Fiberglas sealed with asphalt. Though resembling felt, the Fiberglas, supplied in rolls, has better insulation properties. Because of this, it was not necessary to use a thick mat, such as a built-up felt roof requires.

Form interior columns

Although 6-inch pipe columns were used in some of the exterior walls, all of the interior columns were of 12-inch-diameter reinforced concrete. The columns, resting on concrete footings, were formed with Sonotubes. Workmen building the column wired six ¾-inch reinforcing bars and

(Concluded on next page)

A Cat D7 drags its blade in reverse to level the muddy ground before wire mesh is spread. Electricians are installing the Walkerduct System for electrical and telephone wiring in the floor.

BEAM DATA

Depth, 21"; Width, 36"; Span Length, 40'4"
Designed for H20-S 16-44 highway load
Manufactured by MISSOURI PRES-CRETE, INC.
Overland, Missouri

LACLEDE REINFORCING STEELS strengthen PRESTRESSED concrete

Laclede quality welded wire fabric is shown being placed as the outer reinforcement in the forms, prior to the pouring of prestressed concrete girders at Missouri Pres-Crete, Inc. in Overland, Mo.

Girders, joists and columns manufactured here for highway bridge construction, roof and floor supports, permit faster erection in the field at lower cost—while offering greater architectural flexibility and lower subsequent maintenance cost for wide span, heavy load structures.

Laclede Reinforcing Steels for prestressed and precast concrete members:

multi-rib deformed reinforcing bars
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prefabricated joist reinforcement

LACLEDE

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For more facts, use Request Card at page 18 and circle No. 260

(Continued from preceding page)

Using a Marquette 5/32 rod, a welder makes a connection between the ends of a channel eave strut. Windows will be located between this and the top of the wall.

rings together on the ground to form the cage. After the cage had been tied to the steel in the footing, the tube was slipped over the top.

The column was braced four ways by 2×4's running from the ground to vertical 2×4's banded to the sides of the tube. Concrete for the column was bucketed from transit-mix trucks to the top of the form by draglines. After the concrete had been poured, a ¾-inch plate was anchored into the top of the columns to receive the concrete beams.

Before the floor in the office section of the warehouse was poured, a duct system for electrical and telephone wiring was installed. Because of heavy rains, metal chairs that usually hold the ducts in place could not be used. The double 1×3-inch ducts were set on bricks, which were held in place by a gob of mortar. Central Electric Co., Inc., Memphis, which had the electrical contract, used the Walker-duct System for the floor wiring. The ducts of this system contained ¾-inch risers every 2 feet.

The 5-inch floor was poured on a 6×6, No. 10-gage wire mesh. Mack trucks mounting Jaeger 6-yard mixers drove into the building to place the concrete. A Caterpillar D7 dozer, as well as a Drott Four-in-One mounted on an International TD-9 tractor, was on hand to smooth out ruts made by tires and do fine grading for the floor. After the floor had been hand-floated,

Grades on the 5-inch concrete floor are checked by W. W. Wilkins, subcontractor for part of the floor work. The interior columns, of 12-inch-diameter reinforced concrete, were formed with Sonotubes.

it was finished with troweling equipment. Whiteman, Superior, and Turn-A-Trowel machines were used.

The exterior walls of the building, which were going up while the floor was being poured, consist of brick backed by lightweight concrete blocks. The masonry material was made up into pallets as it was unloaded from trucks. A fork lift, mounted on a Minneapolis-Moline tractor, carried the pallets to the scaffold. The fork lift also shuttled mortar from the Jaeger mixer to the bricklayers.

The brick work was handled by N. H. Schnell, Jr., mason contractor of Memphis. All the brick, as well as the ready-mix concrete, was supplied by John A. Denie's & Sons Co.

The general construction superintendent for Commercial & Industrial was Andy McGee. Herbert Gentry was the job superintendent. Walter Ferrell was job foreman during foundation and floor-slab stage of construction, and Steve Gentry is the foreman for the remainder of the job. The president of Union Realty as well as Commercial & Industrial is Jack A. Belz.

In charge of erection of the prestressed beams for Denie's was L. O. Trumbo. H. O. Pommer kept things moving at the casting yard. P. H. Fanning was chief engineer. THE END

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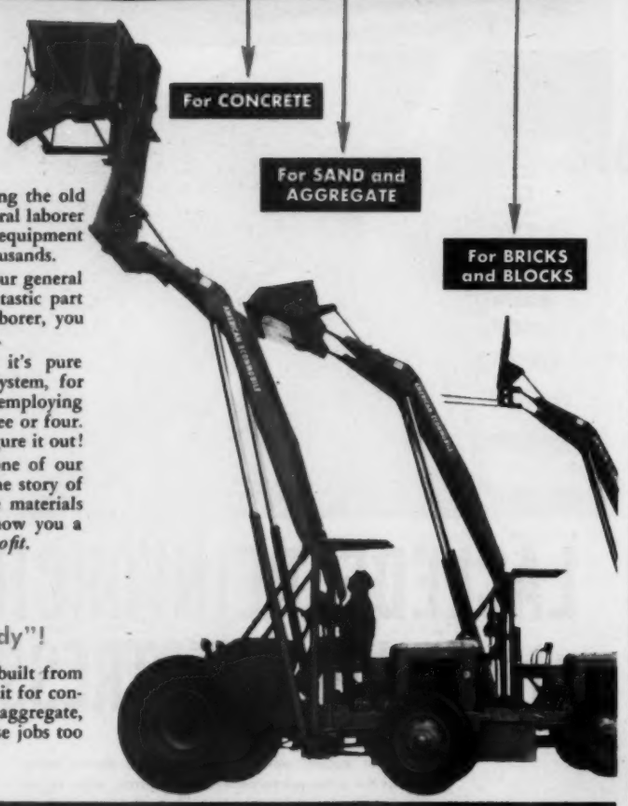

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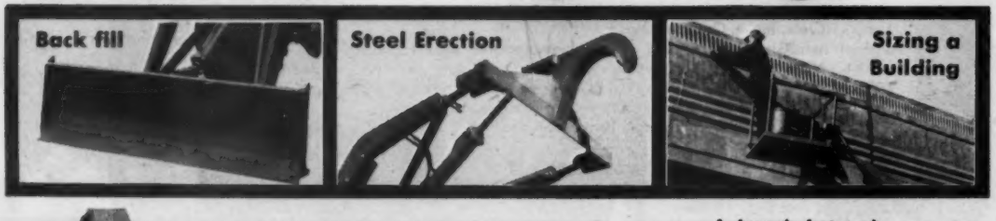

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Constant concrete testing is "form of insurance"

An adequate and systematic method of testing concrete materials is a form of insurance to protect the American taxpayer in the costly but necessary national highway program, according to T. W. Van Zelst, Chicago civil engineer, whose company, Soiltest, Inc., was one of the exhibitors at the recent World Conference on Prestressed Concrete, convening in San Francisco, Calif.

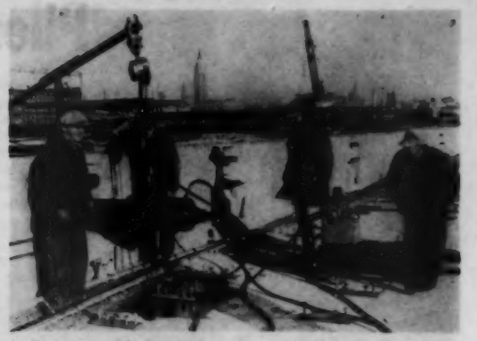
"The taxes of the wage earners of this country are going to pay to support the American highway program. In 1958 almost 2 billion dollars will be spent on this program. We must do all we can to protect this investment. Constant testing with accurate instruments will insure proper design and quality control and long life from every section of concrete road constructed," said Van Zelst.

The Soiltest firm demonstrated the latest model portable concrete-testing machine during the Conference, testing to the breaking point three times a day concrete cylinders obtained from San Francisco area projects, to show the speed, accuracy, and simplicity of use of field testing equipment. The 6-inch-diameter cylinders were subjected to loads up to 200,000 pounds in the Soiltest unit.

Von Spreckelsen joins Burson-Marsteller

Henry H. Von Spreckelsen, the former executive field editor of Construction Equipment Magazine, has joined Burson-Marsteller Associates, Inc., as an account executive for the public relations and publicity agency.

A civil engineering graduate of Cooper Union, Von Spreckelsen was a design engineer and highway engineer before joining Construction Equipment.



PRETENSIONING AND POST-TENSIONING are combined on a single project—a new pier on the Hudson River at Hoboken, N. J. The portable setup, above uses two 200-ton jacks to pretension the cables for stringer sections. Jacks are powered by a high-pressure hydraulic pump. Two gages show individual jack thrust, the third shows pump pressure. The jacking assembly for girder post-tensioning, above, consists of a jacking assembly with one 200-ton jack at each end of a girder. Both the pretensioning and post-tensioning systems were provided by Elgood Equipment Corp., Brooklyn, N. Y., for J. Rich Steers, Inc., New York City, the contractor on this project.

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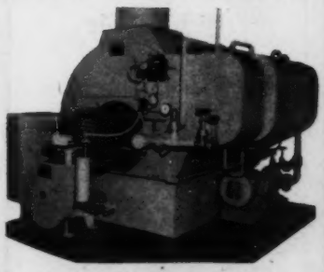

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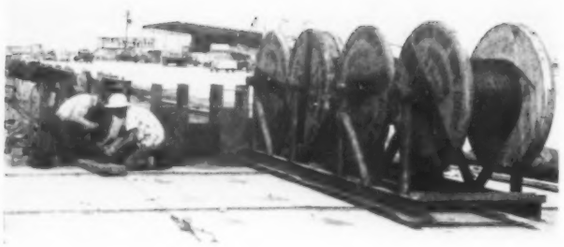
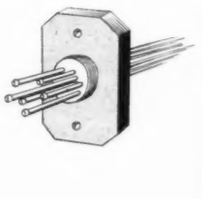
Piles, girders, are prestressed at fast ra

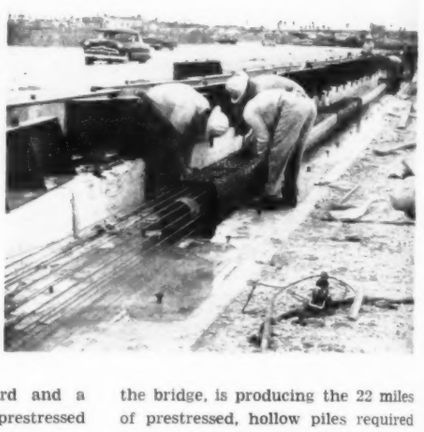
Casting yard turns out 22 miles of hollow prestressed piles; modified lumber carrier brings them a half-mile to the span



At one end of the 500-foot-long, five-row casting bed that supplies piles for both contracts on the bridge, men use hand cranks to apply an initial tension of 1,000 pounds to the 16 Tufwire ⅜-inch strands in the 17-inch-square piles.



Strands tensioned to 6,000 pounds by a 150-ton hydraulic ram, 8-inch Sonovoids placed inside the wire, and the final 13,000-pound tension applied, spiral wrapping wire is spread around the outside of the square formed by the strands.



A well run casting yard and a unique hauling rig keep prestressed piles and post-tensioned girders moving to crews, to keep pace with the construction schedule for the Ship Channel Bridge at Corpus Christi, Texas.

The casting yard, set up by the contractor about a half-mile from the bridge, is producing the 22 miles of prestressed, hollow piles required for the big job. The 40-foot girders for the approach spans are also cast and post-tensioned here.

Both piles and girders are speeded to the bridge by a lumber carrier, rebuilt to handle the long, heavy members. The carrier, which requires

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...or 5,818-foot bridge

only a 3-man crew, does away with the need for two cranes and a flat-bed truck. The rig picks up the 15,000-pound girder, hauls it to the bridge, and sets it down beneath the proper span.

The new bridge, which will carry U.S. 181 over the ship channel, will eliminate the bottleneck caused by the antiquated bascule bridge located just east of the new structure. Designed by the Texas State Highway Department, the 5,818-foot bridge will eventually tie in with expressway projects on the north and the south. In addition, the bridge will permit the construction of a new, enlarged ship channel. The 140-foot vertical clearance and 300-foot horizontal clearance of the bridge will give ocean-going vessels plenty of room to navigate.

The superstructure of the $9 million bridge contains a variety of types of spans. The 620-foot channel span contains a tied-arch section with steel trusses built up from two stub piers. The 1,243-foot cantilever truss unit, which includes the channel span, is flanked on either side by 272-foot deck truss spans. The longer approach spans that adjoin the truss section of the bridge consist of plate girders, and the shorter spans at the end of the bridge are made up of post-tensioned concrete girders.

The 7-inch concrete deck will carry two 36-foot roadways separated by a 4-foot raised median. Cantilevered out from each side of the bridge will be two 3-foot sidewalks. Approach spans are on an easy 5 per cent grade.

Work is well under way on two of the contracts let by The Texas State Highway Department. Contract I, held by Cage Bros., San Antonio, and subcontracted to Ross Anglin & Son, Austin, is for 2,000 feet of completed bridge on the concrete girder spans. Contract II, held by Guy H. James Construction Co., Inc., Oklahoma City, is for the two-column piers for the 3,818-foot central section of the bridge.

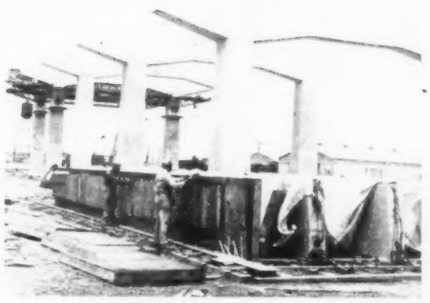
Prestressed piles

Piles are being cast for both contracts at a yard set up and run by Ross Anglin & Son about half a mile from the job. The 17-inch-square piles are prestressed on a 500-foot concrete bed containing 5 rows. Piles are cast around an 8-inch Sonovoid to reduce their weight and cut down on the concrete needed.

Casting and stressing of the hollow piles begins as 16 Tufwire $\frac{3}{8}$-inch strands are strung the length of the bed and pulled to a 1,000-pound tension by a hand "come-along". Set in brackets so that they are positioned 2 inches from the outside of the pile, the strands are tensioned to a total of 6,000 pounds per cable by a 150-ton hydraulic ram. At this point, the wires are spread and the 8-inch Sonovoids inserted in

(*Continued on next page*)

A Rex mixer on an International truck chutes concrete to the forms, while workmen vibrate the concrete and hand-finish the top surface. The cross ties hold the forms together and contain pins that hold the Sonovoid in the center of the pile.



The 60 and 70-foot girders are being cast beneath the piers. Carpenters repair the plywood wall forms, prefabricated in 8-foot lengths. The I-beam-shaped girders have flexible conduits holding wire units in a parabolic arc.

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The larger columns are formed with a chain and pipe system that eliminates the need for corner nailing.

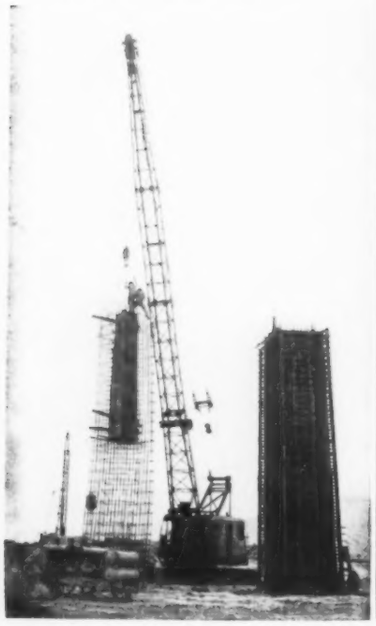
(*Continued from preceding page*)

the cage formed by the wires. Special joints allow the lengths of Sonovoids to be fitted together to form a continuous tube. Then the strands are pulled to a final tension of 13,000 pounds each and spiral wrapping wire is spread out to enclose the cage formed by the strands.

After the steel side forms for a pile have been set, the Sonovoid is centered in the form. The tube is held in place by short rods that screw into the paper wall. The rods, which are removed after concrete is poured, are secured to the steel tie that bridges the form.

Concrete, supplied by Gulf Materials, Corpus Christi, is chuted into the forms from Rex mixers mounted on International and White trucks. Two Viber electric vibrators consolidate the mix and workmen float-finish the surface. Forms are stripped after 3 hours. A total of 5 days has to elapse before the wires can be cut and the piles moved to a stockpile. An additional 5 days of curing under cloth mats and the piles are ready.

A P&H 955LC crane swings a 40-foot cage of steel to a pier footing on the Guy H. James section of the bridge. The cage contains the top half of the box form that makes the pier hollow.



Lumber carrier hauls piles

Although 40-foot girders are also cast at the yard, the greater part of the girders is cast on the ground beneath the piers. Doing a good job of carrying both girders and piles to the bridge is a converted Ross lumber carrier. This rig has built-up boom extensions fore and aft to give it an over-all length of 51 feet. A Tulsa winch, mounted on the rig, controls two cables that lift the girder at each end. The carrier can haul a girder weighing 15,000 pounds or make light work of an 87-foot pile.

Big girders cast at bridge

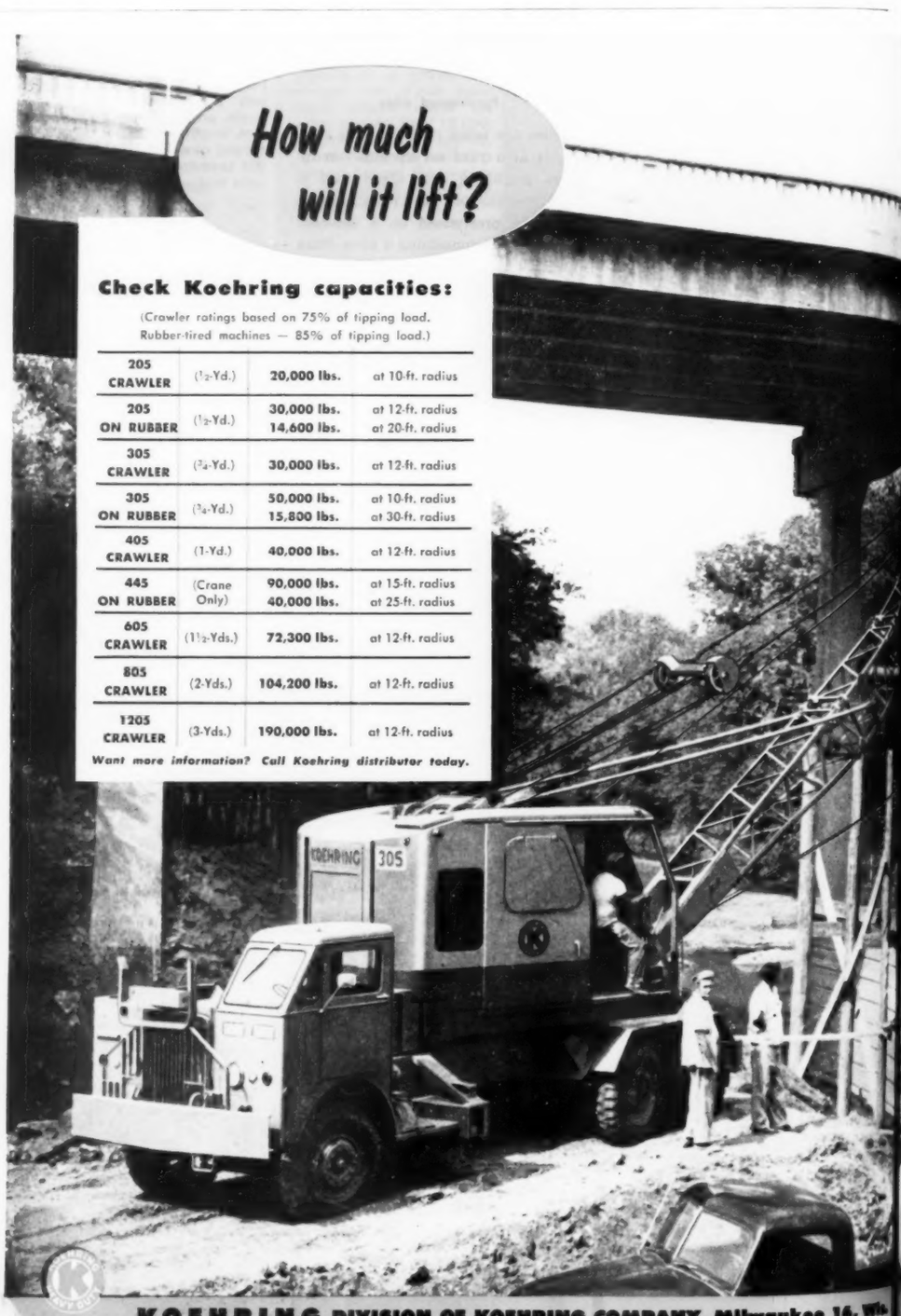
To save on hauling, the contractor is precasting and post-tensioning the larger 60 and 70-foot girders near the span where they are used. The I-beam-type girder for the 60-foot length is 14 inches wide and has a 6-inch web. The girder is 4 feet 8¾ inches deep.

Timber planking on the ground supports the conventional plywood forms for the girder. Six 1⅜-inch flexible conduits are held in place for the length of the form to carry the post-tensioning wires for the 60-foot girder. The other three conduits, set in a triangular pattern at the bottom of the girder, also hang in a slight arc. When tensioned through the conduits, these wire units give the girder a slight camber.

The wire units used in the tensioning are fabricated for each size girder. They are not a woven wire; each unit contains 10 or 12 separate ¼-inch wires that are held in place at their ends by a heavy metal disk. After the girders are 14 days old, the wire units are threaded through the conduits and tensioned. Two 100-ton hydraulic rams, tensioning one wire unit at a time, bring the total tension for the six units up to 560,000 pounds.

Two Koehring 305 truck cranes are used to lift a big girder to the

Hauling 40-foot girders and [illegible] from the casting yard to the br[illegible] a half mile away, is done fas[illegible] easily by this converted Ross lu[illegible] carrier. A Tulsa winch on th[illegible] controls cables that lift the g[illegible] at each end. ►


How much will it lift?
Check Koehring capacities:
(Crawler ratings based on 75% of tipping load. Rubber-tired machines — 85% of tipping load.)
205 CRAWLER (½-Yd.) 20,000 lbs. at 10-ft. radius
205 ON RUBBER (½-Yd.) 30,000 lbs. at 12-ft. radius; 14,600 lbs. at 20-ft. radius
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605 CRAWLER (1½-Yds.) 72,300 lbs. at 12-ft. radius
805 CRAWLER (2-Yds.) 104,200 lbs. at 12-ft. radius
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Want more information? Call Koehring distributor today.
KOEHRING 305
KOEHRING DIVISION OF KOEHRING COMPANY, Milwaukee 16, Wis.

Piles are driven to an average depth of 70 feet and to a minimum of 50 tons bearing by a Manitowoc 3900 with 90-foot leads and a steam-powered Vulcan OR hammer. This work is on the 3,818-foot center section, which Guy H. James is building.

top of the piers. The base plate at the end of the girder is bolted to the shoe on the pier cap. There are ten girders per span and, altogether, 370 concrete girders are required.

The substructure for the middle portion of the bridge is being built by Guy H. James Construction Co., Inc. It consists primarily of twin-column piers resting on block footings founded on clusters of prestressed-concrete piles. The piles are being driven to an average depth of 70 feet and a minimum bearing of 50 tons by a Vulcan OR steam-driven hammer. Handling the hammer is a Manitowoc 3900 with 90-foot leads. The hollow piles are cut off to grade by jackhammers.

Both James and Ross Anglin use a unique method of forming the big columns. This requires chains to be tightened around the column to bear on four pipes held in place at the corners of the form. In the larger columns, a 6-inch pipe is wedged in the right angle formed by the extension of horizontal 2×6 backing. When the chains are tightened, the pipes hold the corners of the form snugly together. The pipe arrangement makes a good rigid form and eliminates the need for corner nailing and bolting. Tie bolts, seated on double 2×8 wales, are also used in the forming. Columns vary from 58 to 104 feet in height, from the bottom of footing to top of cap, on James' section of the contract. All four sides are on a 3/16 inch to the foot batter.

Form work for the cap of the column rests on a steel truss supported by steel bolts in the tops of the columns. The bolts, which run through two precast holes at the top of each column, have a steel support and screw-jack arrangement at their ends. The jack adjusts the truss to exact grade. Plywood forms, prefabricated in three box sections, are used to form the cap.

Personnel

The project manager for Ross Anglin is Horace Ivy. His assistant superintendent is Dan Cogan. For Guy H. James, Roy Banning is the superintendent. The general superintendent for Guy James is R. E. Leech. Ross Anglin, Jr., is the contractor's engineer on the Cage Bros. contract.

Lewis H. White is project engineer for the highway department. Supervisors of the two contracts are Obie L. Etheridge and Michael M. Leyendecker. THE END

With Koehring 305 truck crane on this job, contractor is equipped to lift up to 25 tons on 30-foot boom. When extra reach is needed, crane handles maximum 100-foot boom plus 30-foot jib with low A-frame.
CK754

145 batches an hour on airport paving job

Supplying two 34-E pavers at new airbase, this Johnson one-stop automatic plant weighed out 1669 batches during an 11½-hour peak period—averaged over 145 batches hourly. Each 1.38-cu. yd. batch consisted of 5 materials: sand, 2 aggregates, 2 types cement. Johnson plants are available with multiple arrangements of single-material batchers, automatic push-button control, graphic weight-recording for any 1, 2 or 3-stop operation.

C. S. JOHNSON · Champaign, Ill.
(Koehring Subsidiary)

Producing concrete for foundation footings

When contractor was ready to pour footings he saved time and money by mixing his own concrete on the job — had the concrete just when he needed it. This Kwik-Mix 11-S is available on 2 or 4 wheels, with side or end discharge — has double-mixing action, automatic water system, tilted Flow-Line discharge, optional Batchmeter. Other sizes — 3½-S to 16-S. Also: plaster-mortar, bituminous mixers, material-handling Moto-Bugs®.

KWIK-MIX · Port Washington, Wis.
(Division of Koehring Co.)

Speeds installation of telephone cable

Opening trench 4 to 5 feet deep, 24 inches wide, for underground cable system, Parsons 150 wheel Trenchliner® averaged 1026 lineal feet an hour through rough, wooded country. It's a heavy-duty, high-production ditcher, digs 16 to 26 in. wide, at depths to 5¾ feet. Has hydraulic wheel-hoist, controlled discharge, quick-change buckets, optional tile-layer. Check Parsons line for any trench 8 to 72 in. wide, 19 ft. deep.

PARSONS · Newton, Iowa
(Division of Koehring Co.)

A70

For more facts, use Request Card at page 18 and circle No. 269

Religious building design pictured, detailed in book

"Religious Buildings for Today", edited by John K. Shear, surveys 35 outstanding churches and synagogues throughout the world. Each case study includes interior and exterior photographs of the buildings, detailed floor plans, and structural diagrams.

The book also contains data on program requirements, structural methods, and design characteristics. Chapters discuss the design of churches, worship and the arts, structural expression, and the church and its school. A bibliography and index conclude the book.

Priced at $7.50, the book may be purchased from the publisher, F. W. Dodge Corp., 119 W. 40th St., New York 18, N. Y.

For more facts on Insert, circle No. 271→

A worker, center, lays the floor channel for the steel wall partitions, as a workman, left, brings in another 3-inch-thick partition. In the background, a worker attaches a linking device on the side of the panel, while another man on a ladder steadies the partition.

Steel wall partitions replace usual wet walls in New York City building

What may well turn out to be one of the most progressive construction steps in interior layouts of large office buildings is currently taking place at 666 Fifth Ave., New York City. In the 38-story Tishman building, workmen are installing prefabricated steel walls instead of the customary wall partitions of sand, tile, plaster, water, and mortar.

Several important "firsts" are tied in with the installation of the walls. It is the first time prospective tenants of a rented office building have been given a choice between steel wall partition or the customary wet wall construction; it is the first time steel partitions have been specifically designed to replace the plaster and mortar wall; it is believed to be the first time that interior walls have been installed before the ceilings have been hung; and it is the first time that the wall panel has gone through the ceiling, rather than to it.

Manufactured by the E. J. Boyle Division, Aetna Steel Products Corp., Pottsville, Pa., the wall panels are 3 inches thick and are made of No. 20-gage cold-rolled stretcher level steel. Hat stiffeners on each panel are located 9 inches apart on center to provide the desired rigidity. The 2-inch difference in width between the two walls will provide an additional 16,000 square feet of usable floor space in the 1,050,000-square-foot building.

Space between the steel panels is packed with bats of rock wool for insulation against sound and fire. When the steel panel is installed, a continuous floor channel is first fastened to the floor with 3-inch drive studs that are ¼ inch in diameter. The channel is made of 16-gage rolled steel. After the channel is laid, a panel strut is fastened to the channel. The wall rests on the strut, which also serves as a centering, leveling, and keying device.

When the wall panel is in place, approximately 3 inches of open space for wiring remain between the wall and the channel. After the wiring has been completed, a snap-on base covers the open area between the wall and the floor, completely concealing the wiring. Once the panel has been erected, the ceiling can be installed and fastened to it by angle clips. While the wall can support the ceiling, the ceiling does not support the walls.

Lively-Blair news

Thomas G. Sanberg has joined Lively-Blair & Associates, Inc., Minneapolis, Minn., construction safety engineering consultants. Sanberg will serve the firm's contractor accounts in Michigan, northern Ohio, Illinois, and Indiana. Sanberg has served as administrative assistant for the Associated General Contractors of Minnesota, Inc.

Biggest Favorites . . . because they're Biggest Savers!

BUFFALO-SPRINGFIELD ROLLERS

are made to cut schedule time, job and operating costs

These rollers, two Standard-Duty and one Heavy-Duty model, are built with the contractor in mind. All have many outstanding and exclusive performance-plus features. They represent the very best tandems on the market today.

Heavy-Duty models, ranging from 5-8 to 10-16 tons, are designed especially for heavy-duty highway and public works projects, and for all types of finishing, maintenance and repair work. Built-in quality features . . . such as unmatched 4-speed transmission or torque converter drive with 2-range transmission, powered roll brakes, higher ground clearance, greater operator visibility, complete protection against any possible damage to the transmission and final drive gears . . . cut operating and maintenance costs to an absolute minimum.

Standard-Duty models, designed and built with the thought in mind that not every job, not every user, requires the ultimate in roller equipment, are available from 5-8 to 10-14 tons — and for the dollar invested, represent the finest rollers on the market today.

Both lines offer the best in: choice of highly efficient gasoline or diesel power • finest adjustable bevel gear final drive • single power unit assembly assuring precision alignment of engine, transmission and final drive pinion • variable rolling speeds in either direction up to 5.6 mph • low-pressure hydraulic steering • and adjustable, tapered roller bearing yoke and king pin assembly.

Before you buy another 2-axle tandem roller, see your Buffalo-Springfield distributor; write for complete details.

BUFFALO-SPRINGFIELD ROLLER CO.

DIVISION OF KOEHRING COMPANY • SPRINGFIELD, OHIO

For more facts, use Request Card at page 18 and circle No. 270

'Euc' Scrapers Protect Profits

AGC predicts big construction volume, sharper competition, tighter profit squeeze in years ahead.

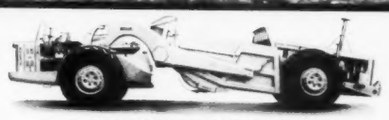
With low bid prices, you need equipment that increases productivity to protect your profit margin.

Only Euclid Offers These

3 TYPES

of Performance-Proved SCRAPERS

Complete data on Euclid Scrapers shown on the following pages is available from the dealer in your area or from Euclid Division.



TWIN-POWER

OVERHUNG ENGINE

SIX WHEELER

Small Job
or Big Project...

TWIN POWER
for
OUTSTANDING PERFORMANCE

This exclusive Euclid development has put the "Twin" years ahead of any other scraper . . . in performance, workability, and in productivity. By using two engines—each driving an axle through separate Torqmatic Drives—the "Twin" has tremendous power and traction. It can work independent of other equipment on small grading jobs or big yardage projects. It has set new production records on a wide range of earthmoving work and has consistently moved the cheapest dirt.

With "Twins" in your fleet you can meet the challenge of tougher competition and rising costs and still protect your profit margin.

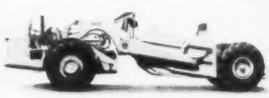
SPECIFICATIONS

Model TS-24

518 total h.p. • 24 yds. struck and 32 yds. heaped • 27.00 x 33 tires • Torqmatic Drives • NoSpin Differentials

(33.5 x 33 tires available as optional equipment)

All Euclid Scrapers have
these *profit-making* features:



3 SIZES of OVERHUNG SINGLE ENGINE SCRAPERS

With struck capacities of 7, 12 and 18 cu. yds., there's an overhung engine type "Euc" for practically any job requirement. Each is a top performer in its class with advanced design features that cut cycle time and step up production. Short "nose" overhang provides greater stability and operator comfort—permits "Eucs" to utilize faster travel speeds. Full 90° steering with push-pull hydraulic jacks gives good maneuverability, short non-stop turns.

All of these scrapers are designed for easy maintenance—major disassembly is not necessary to service or replace main components of power train. This cuts downtime to a minimum and pays off in more payloads per day and lower maintenance cost.

MODELS AND SPECIFICATIONS

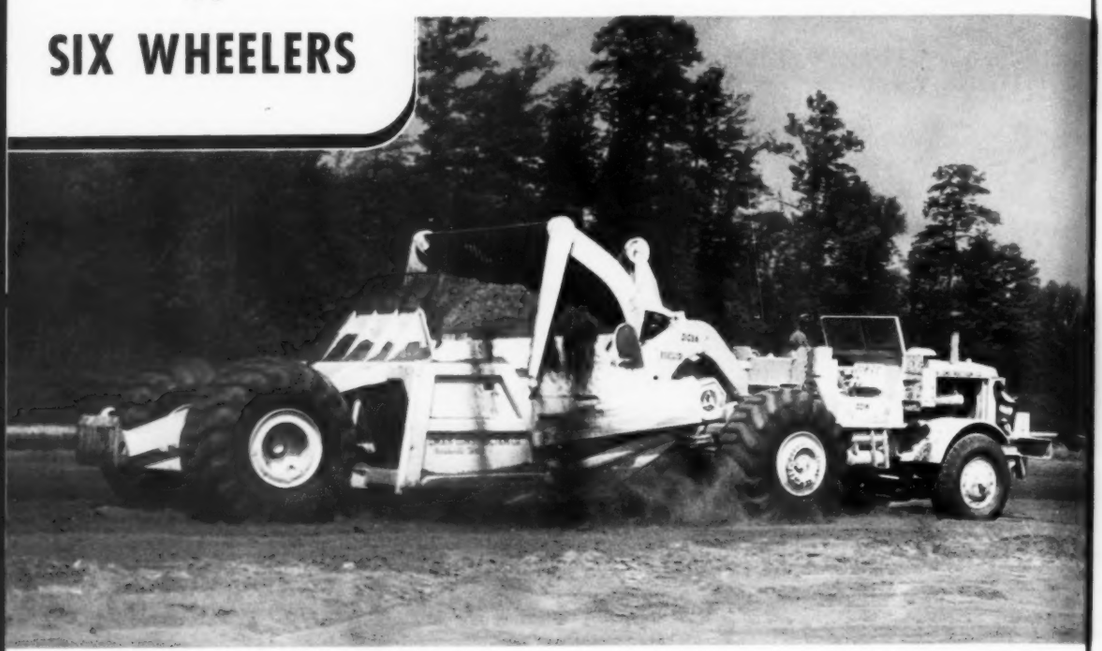
S-7	143 h.p. · 7 yds. struck and 9 yds. heaped · Torqmatic Drive 18.00 x 25 tires (21.00 x 25 optional)
S-12	218 h.p. · 12 yds. struck and 16 yds. heaped · 5 speed transmission 24.00 x 25 tires
S-18	300 h.p. · 18 yds. struck and 25 yds. heaped · 4 Speed Torqmatic Drive · 27.00 x 33 tires (33.5 x 33 optional)

Note: Rear-Dumps of 12 and 35 tons are interchangeable with Models S-7 and S-18 respectively · 13 yd. Bottom-Dump is available for Model S-12.

Hydraulic Lever Action · 4 section Reversible and Interchangeable Cutting Edges · Original low wide bowl design · Performance-Proved Euclid Planetary Drive · Unequalled Accessibility · Easy Operation Fast Loading and Dumping

For high speed, long haul work, these 4-wheel tractor scrapers provide maximum stability. They have struck capacities of 12, 18 and 24 yds. and the same cost-cutting features—hydraulic lever action, 4-section cutting blade, low, wide bowl, etc.—of other Euclid models. In spite of rugged structural strength that's designed for work with big pushers, these "Eucs" have less weight per horsepower, giving them performance that helps protect your profit margin by moving more yards at lowest cost.

3 SIZES of SIX WHEELERS



MODELS AND SPECIFICATIONS

SS-12	200 or 218 h.p. • 12 yds. struck and 16 yds. heaped • 5 speed transmission • 21.00 x 25 drive and scraper tires (24.00 x 25 optional)
SS-18	300 h.p. • 18 yds. struck and 25 yds. heaped • 3 speed Torqmatic Drive • 24.00 x 25 drive and scraper tires (29.5 x 25 optional)
SS-24	300 or 335 h.p. • 24 yds. struck and 32 yds. heaped • 4 speed Torqmatic Drive with converter lock-up • 27.00 x 33 drive and scraper tires (33.5 x 33 optional)

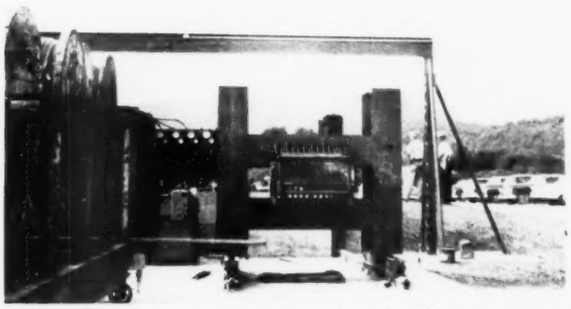
Note: Bottom-Dumps of 13, 17 and 25 yds. struck are interchangeable with the scraper bowls.

EUCLID DIVISION

General Motors Corporation • Cleveland 17, Ohio

Form No. 510

577-350—Printed in U.S.



◄ The pioneer prestressing installation for Schuylkill Products, Inc., Cressona, Pa., uses the four-point synchronized tensioning system devised by Elgood Equipment Corp., Brooklyn, N. Y. Each casting bed uses four long-stroke jacks, so grouped that the need for locating the center of gravity of a bed is unnecessary. This perimeter grouping provides equal elongation of the jack rams, even if loadings on a vertical or horizontal axis are different. Above multiple feed-through of strands is provided by reels mounted on a car at the end of the beds. Jacks are transferred between beds by the overhead trolley hoist.

Newest salary survey places civil engineers at bottom of ladder

Median earnings of engineers increased 21 per cent in the period 1952 through 1956, according to the results of a survey now available in pamphlet form.

Titled "Professional Engineers' Income and Salary Survey", the booklet points out that young engineers, chemical engineers, and engineers in education made the largest salary gains, while those employed by federal agencies chalked up the smallest increases.

The survey is based on an analysis of 17,000 questionnaires answered by registered professional engineers in all technical branches. The median salary for those responding in 1956 was $9,490, as compared with $7,850 in 1952. Civil engineers had the lowest median earnings of any of the major branches—$8,750.

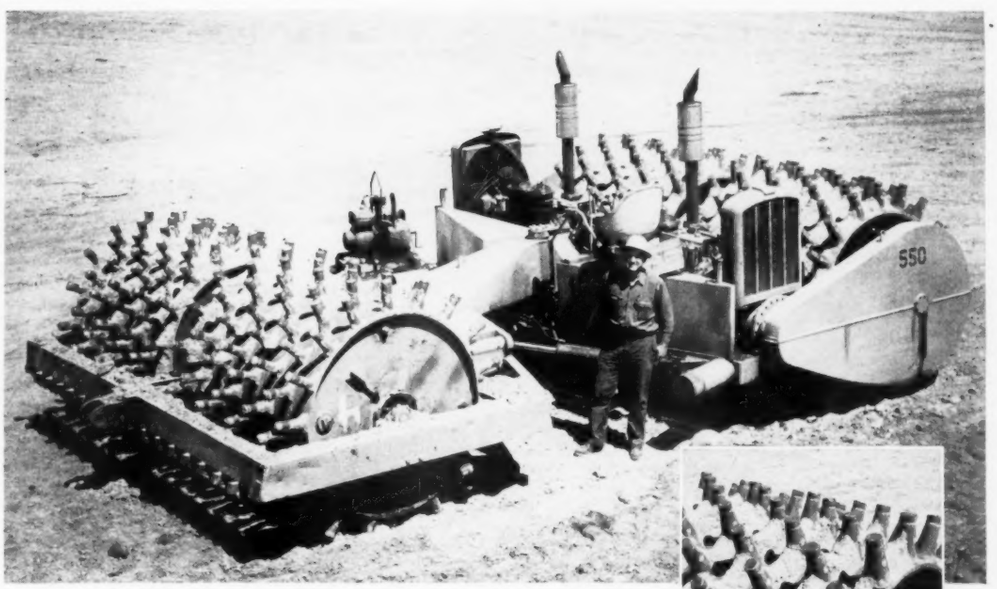
Published by the National Society of Professional Engineers, the survey is the third of a series. The biennial surveys are part of a long-range income and salary-study program being made by the society. Copies may be obtained for $1 each from the NSPE headquarters, 2029 K St. N. W., Washington 6, D. C.

Booklet contains data on plywood diaphragms

"Basic Facts about Fir Plywood Diaphragms", a new booklet from the Douglas Fir Plywood Association, contains all available data about plywood diaphragms. The booklet explains how plywood diaphragms can be used to precisely engineer structures of any size or design to withstand lateral loads caused by windstorm or earthquake.

Other sections of the booklet show the advantages of fir plywood for diaphragm construction; the importance of diaphragms in wind and earthquake resistance; and present an explanation of how a diaphragm works. Tables, diagrams, and on-the-job photos supplement the written material.

The booklet may be obtained from the Douglas Fir Plywood Association, Tacoma 2, Wash.



MORE SPEED WITH NEW COMPACTOR

Conventional compactors are not fast enough for the Mittry Construction Co. —so this firm designed and built the double drum monster shown above on a job in Santa Maria, California. Two 200 H.P. diesels drive the machine through torque converters at a speed up to 8 m.p.h.; hydraulic rams operate the steering mechanism. Bare weight is 75,000 pounds; with ballast, 100,000 pounds. This compactor is now doing the work of three ordinary pieces of equipment.

Since speed is the basic reason for this new machine, every factor that keeps it on the job and reduces down-time for repair or parts replacement has been given close consideration. For example, tamper feet might be expected to wear rapidly at high operating speeds; to cut such wear to a minimum the feet were treated to a band of Stoody 121 applied by the semi-automatic welder before the machine went into service. The inset photo above illustrates the appearance of the feet as hard-faced. There will be little "time out" for replacements here!

And on the subject of getting the most out of sheepsfoot tampers—here are two other commonly used methods of restoring worn feet. Both are illustrated at the right. The first method uses short lengths of pipe driven over the worn ends, the "cups" then being filled with deposits of Stoody 121 applied by the semi-automatic welder. This method of weld casting is extremely fast and the ring restores both size and height of the foot. On square shanks the ring may be welded first to close the bottom opening. This method has the advantage of saving time in removing the tamps from the machine.

The second procedure is the use of a split mold, either copper or carbon. The cavity above the stem approximates the original size and shape so the weldor simply fills in with Stoody 121. Gauge is restored automatically. Both methods provide far longer service life at very considerable savings.

The Stoody Guidebook covers hard-facing procedures for all types of heavy equipment. See your Stoody dealer (check the "Yellow Pages" of your phone book) or write direct to the company for a free copy.

Feet are kept out-to-size and with square edges by a single bead of Stoody 121 applied around the perimeter.

Fast repairs result without removing tamps from the machine by driving cups over the worn ends and filling with Stoody 121.

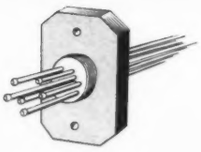
The carbon or copper split-mold surrounds the tamper and forms a cavity which is filled with Stoody 121 by the semi-automatic process.

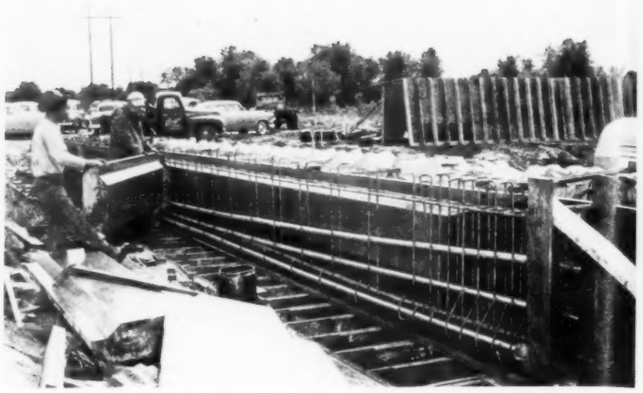
STOODY COMPANY

11936 East Slauson Avenue • Whittier, California

For more facts, use Request Card at page 18 and circle No. 272

Crews place the prefabricated reinforcing cage for one of the 68.25-foot-long and 3-foot-high girders. The I-shaped member has a heavy bottom flange and a lighter top flange. Forms for a bridge abutment are being erected, background.





The four flexible steel sheaths for the prestressing wires in place and tied to the reinforcing, the remaining side of the girder form is set. Individual form sections are light enough to be handled by two men.

Similar girders for two spans cast at rate of two per day

Workmen insert the inside portion of a notched, split ring between the wires and then pull the ends together by wrapping a wire around them and twisting it with a screw-driver. The outer ring has already been set.

Using a hooked rod, a workman pulls the locking ring into place so that the upset heads on the wire bear against the two portions of the ring. Both sections of the ring have semicircular notches that line up to form holes for the wires.

Prestressing wires, with upset heads made to measure, are inserted to post-tension the 54 concrete members

by RALPH MONSON,
field editor

Using only two sets of steel forms and 18 bottom pallets, Brogan Construction Co., Des Moines, Iowa, cast 54 identical prestressed concrete girders for two bridges on a highway relocation north of La Crosse, Wis. The high-tensile reinforcing wires were inserted into sheaths in the girders and post-tensioned after the concrete had cured.

With this method, the contractor was able to cast two girders almost every working day, using the same crews building the piers, abutments, and decks of the bridges. One crane handled the pile-driving equipment for the bridge foundations and also set the prestressed girders in place.

The new structures were built on a new alignment nearly parallel to the old road at Marshland in an area where the old highway was subject to flooding several times a year. In this area, the Trempealeau River and Pine Creek cross the highway before entering the Mississippi River within about a half mile of each other.

Since the old bridges over both streams were inadequate to carry the maximum flood flows, the highway stretch between them had been designed and built as an overflow sec-

A Simplex hydraulic jack, supported by a Coffing chain hoist, is attached to the ring so that enough tension can be applied to permit a split bearing ring to be inserted between the segmented ring and a bearing plate.

At the other end of the girder a Greenlee pump, powered by a Briggs & Stratton engine, operates the Simplex jack that stretches the 16 wires in each cable to the required length.

Measurement shows the wires have been stretched at least the $4\frac{3}{4}$-inch minimum required for proper tensioning. Shims will be placed to maintain this tension while the jack is released and removed.

tion to augment the bridge capacity. During flood periods, this situation was inconvenient and dangerous for traffic, and the overflow section of the road was difficult to maintain.

Grading, paving

In addition to the two bridges, the remedial project included separate contracts for grading and paving the new alignment. The grading, done by A. F. Schams, La Crosse, consisted primarily of sandrock borrow hauled in from a nearby fill to make the bridge approaches and the highway grade between the bridges. This contractor also placed the base course. The drilled and blasted sandrock was loaded and hauled to the fill by a spread of scrapers. Three C Tournapulls and a pair of Cat D8 tractors with scrapers, aided by three Cat D8 and D7 tractor-dozers and a No. 12 motor grader, built the embankments. The 24-foot roadway is being paved with 3 inches of bituminous surfacing under a separate contract.

A channel change for the Trempealeau River was included in the grading contract. The new channel was partially excavated ahead of the bridge construction, but the flow of the stream was maintained in the old channel. This made it possible to construct the bridge at this site entirely in the dry. In the course of work on channel changes and improvements, a Koehring 405 dragline with a Hendrix $1\frac{1}{2}$-yard bucket moved some 65,000 cubic yards of unclassified excavation in the valley.

Similar girders

The bridge over the river is a three-span structure resting on two piers and two abutments. The bridge over Pine Creek and its floodway consists of six spans supported on five piers and two abutments. The roadway, with each of the nine spans supported on six prestressed-concrete girders 68.25 feet long and 3 feet high, requires a total of 54 similar girders.

The usual cross section of the girders is in the shape of an I with a heavy bottom flange and a lighter top flange. The lower flange is 1.5 feet wide and a foot high with its top edges sloping at 1 to 1 away from the 6-inch web. The top flange is a foot wide and 7 inches deep and carries a series of shear blocks to tie the girder to the deck slab.

Girder forms

Brogan used just two sets of steel forms and 18 bottom pallets to form the 54 girders. The casting was done at two sites near the respective bridges. One of these was on the new grade and the other was beside the old roadway. Both were easily accessible for transit-mix concrete trucks to place the concrete.

To prepare the casting bed, the contractor laid timber sills in the sand and placed 2×6 joists across the sills to support the girder bottoms and side forms. Pallets or girder bottoms of 1-inch lumber were set up for the 18 girders. Girders were formed, two at a time, in sectional steel forms supplied by the Steel Crete Construction Co., Milwaukee. This firm also subcontracted the post-tensioning of the beams.

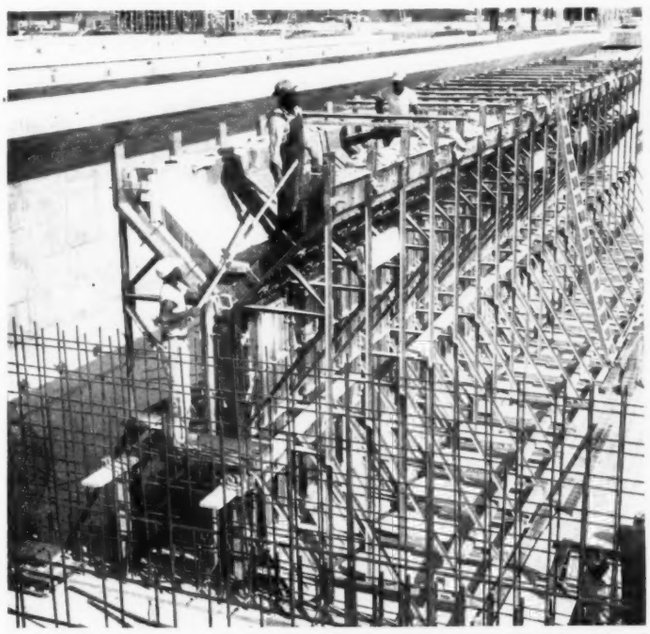
The individual sections of a steel form were light enough to be placed by two workmen without help from a crane or hoisting equipment. The men set up the form for one side of the girder, bracing it from the girder previously cast or from the joists of the casting bed. The side forms rested on the joists and were clamped against the pallets to hold them in place.

When one side of the form had been placed, the crew carried in the prefabricated reinforcing cage containing the conventional reinforcing for the entire girder. Flexible steel sheaths for the four prestressing cables were then strung into place and tied to hold the conventional reinforcing in position.

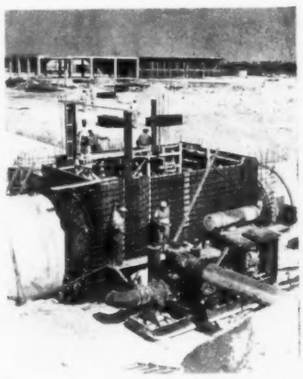
The steel forms for the other side of the girder were set in place on the joists and tied to the first side with Pony adjustable clamps at both top and bottom. Bulkheads carrying the bearing plate assemblies for the prestressing wires were set in the ends of the form, and the girders were ready for casting.

Pour from transit mixers

The low-slump concrete for the girders, supplied by Winona Concrete Products Inc., Winona, Minn., used $\frac{3}{4}$-inch maximum-size aggregate and

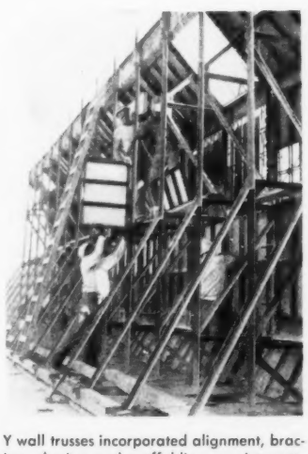


Special Y wall forming system makes for simplified stripping operation. 100% reusability of all materials. Note complete absence of lumber normally required for shoring and bracing on this type of structure.



Intricate forming in restricted areas presented no problem. Uni-Form Panels erected aligned and braced one side eliminated difficulties normally encountered in placement of reinforcing steel. Note Uni-Form Panels around large precast pipe.

One side aligning and bracing provides clear unobstructed working areas increasing job efficiency.



Y wall trusses incorporated alignment, bracing, shoring and scaffolding requirements.

CUTS MATERIAL COSTS with Pre-Fab Form System on Sewage Plant Job

In the construction of the Miami Sewage Treatment Plant Job the Paul Smith Construction Co., of Miami, Florida chose to use the Uni-Form Panel System in the forming of one million sq. ft. of contact area. The contractor estimated that the use of the Uni-Form System *saved 40 percent in material costs alone.* In addition, faster form erection with fewer men kept the job moving ahead of schedule and reduced estimated labor costs considerably. These fine results were obtained even though this was the contractor's first experience with the Uni-Form Panel System.

This considerable savings in material and labor was realized in spite of intricate Y wall forming and pipe intersections which causes complicated forming problems with conventional forming systems.

Pre-fabricated, ready to use—completely engineered to handle most forming problems, the Uni-Form Panel System provides such advantages as simple assembly—minimum one side alignment and bracing—automatically accurate wall widths—positive internal spreading—faster stripping and maximum re-usage to give the contractor lowest all around form costs.

Y wall trusses designed to member with standard Uni-Form Panels formed a completely automatic system for handling the special forming problems, and were big factors in the economy and speed obtained on the job. Simple assembly of Standard Uni-Form Panels on the trusses eliminated many of the aligning, bracing and spreading problems usually encountered in Y wall construction. In addition to simplified forming the combination system of standard Uni-Form Panels and trusses eliminated many of the problems normally encountered in the stripping of a wall section of this type. The contractor was well pleased with all phases of his forming and stripping operations.

Why not investigate the many advantages the Uni-Form Panel System can bring to you? Write for the Uni-Form Catalog — or better yet, send us a set of plans for an estimate on your next job. Let us prove to you as we did to the Paul Smith Construction Co., that the Uni-Form Panel System can cut your forming costs.

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7.3 sacks of cement per cubic yard. The contractor usually made pours directly from the trucks, but in the few cases where concrete could not be placed this way, a crane with a ½-yard laydown bucket handled the job. Jackson gasoline-powered vibrators helped work the concrete down into the forms as it was consolidated.

The girders were covered with wet burlap for seven days. Their ultimate design strength called for a strength of 5,000 psi, which was obtained in 28 days or less. The beams could, however, be stressed when concrete showed a strength of 4,400 psi. Depending on weather and other conditions, this strength was obtained in from 10 to 21 days. Two girders were cast every working day, providing pallets were available. When all the pallets were in use, work was suspended until some of the girders had been stressed and removed from the casting bed.

As the girders were stressed, they took on a camber that raised the center off the pallets and concentrated the weight on the ends. This had a tendency to overload the sills at the ends and force them down into the sand. Before the bed was used to cast another set of girders, these ends were shimmed up and the bed was carefully leveled.

Post-tensioning

Steel-Crete Construction Co., Milwaukee, Wis., which subcontracted the post-tensioning operation, used the PI method of Prestressing, Inc., San Antonio, Texas. Each end of the reinforcing wires was upset to form two heads like duplex nail heads. One head was at the end of the wire and the other about 4 inches in from the end. The outer heads were engaged by the tensioning jacks, while the inner heads bore against the locking rings that held the wires in place after tension had been applied.

After the girders had been cast, the length of each hole was carefully measured and a set of 16 wires was made up to fit this length. Each of the wires was 0.25 inch in diameter and had a minimum ultimate tensile strength of 240,000 psi. One end of each of the wires was fed through one of the 16 holes in a solid anchor ring, and the double heads were formed so that the inner head contacted this ring. Similar heads were formed on the other end of each of the wires. These ends, however, were left free to be inserted into a segmented ring at the other end of the girder. This preparation of the wires was done at a plant set up on a nearby project at Nelson, Wis.

When the concrete had attained the required minimum compressive strength of 4,400 psi, the post-tensioning crew pulled the sets of prepared wires through the sheaths in the girders and applied the tension to the wires.

To engage the free ends of the wires, the contractor attached a segmented cast steel ring to the 16 wires in each group. This ring consisted of an outer circle, plus an inner core that fitted against a shoulder on the outer ring. Each section had semicircular notches that lined up to form circular holes for the wires when the two sections were fitted together.

The outer circle was placed over the wires and inserted into the socket of the bearing plate assembly in the end of the girder. The inner core was then placed inside the group of wires so as to force each wire into its proper place in the ring and have the inner heads bearing against the ring.

A jacking ring was then attached to the outer heads and a Simplex "center hole" hydraulic jack was attached to this ring. Using a Simplex hydraulic hand pump, a workman applied just enough tension with this jack to permit a split bearing ring to be inserted between the segmented ring and the bearing plate.

Moving the jack to the other end of the girder, the workmen attached it to the heads on this end of the wire and applied the remainder of the tension from this end. Here, a Greenlee hydraulic pump powered by a Briggs & Stratton gasoline engine supplied the power to the Simplex "center hole" 100-ton jack as it stretched the wires to the required tension.

Apply tension

To determine the amount of tension applied to the wires, the workmen observed the pressure on the gage attached to the hydraulic line of the jack and continued pulling until this pressure exceeded 6,250 psi, or 64 tons per group of 16 wires. They also measured the amount of stretch in the wires and continued jacking until the elongation exceeded $4\frac{3}{4}$ inches. When the four cables had been pulled to this tension, the girders usually assumed a camber that raised the center about $1\frac{3}{8}$ inches off the pallets.

While the jack maintained the tension, cast steel split rings were inserted between the bearing plates on the end of the beam and the solid ring on the wires. This is the permanent means of maintaining the tension.

After a series of beams had been post-tensioned, a grouting crew moved in with a trailer-mounted grouting unit manufactured by Mayo Tunnel & Mine Equipment, Lancaster, Pa. The sand-cement grout was mixed in a small mixer and forced from a pressure tank into the spaces around the wires inside the sheath.

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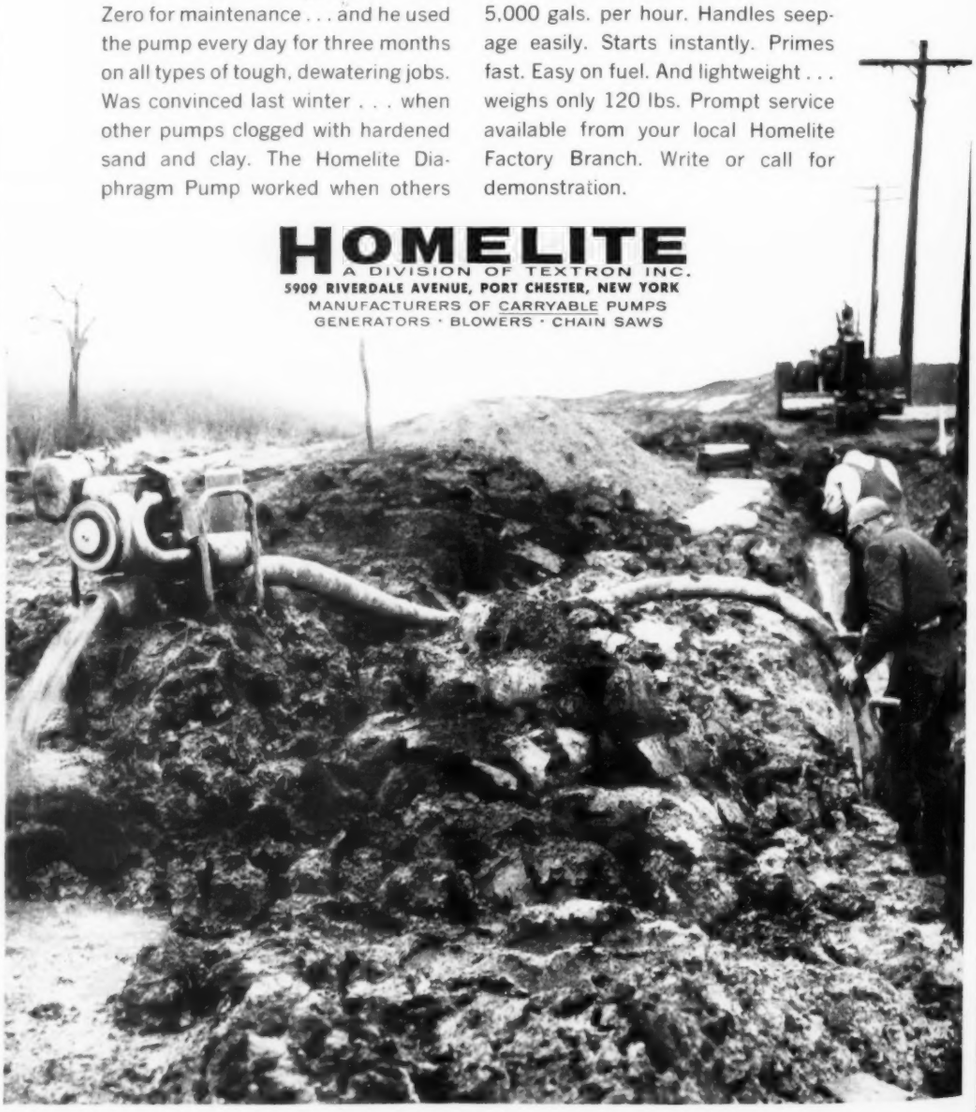

For more facts, use Request Card at page 18 and circle No. 274

When this grout had set up, the beams were ready to be placed.

During the casting operation, the contractor provided an attachment for lifting the girders. Two $1\frac{1}{4}$-inch Richmond screw anchors were cast into the top of each girder, one near each end. The bolts were placed so that the heads projected out of the concrete at an angle and the nuts were embedded in the girder. When the concrete had hardened, the bolts were removed and eye bolts were threaded into the embedded nuts. Cables attached to these eye bolts enabled the crane to lift the girders without using any kind of strongback or spreader.

The post-tensioning crews also made good use of the lifting bolts to tie down a cantilever frame used to support the heavy pulling jack. This frame rested on top of the girder and projected about four feet out over the end of the girder.

Mounted on the cantilever arm was a Coffing Hoist unit rated at 500 pounds capacity. With this handy little hoist, the workmen quickly and easily picked up the heavy hydraulic jack and held it accurately in place while it was being attached and made ready for tensioning. They used it again to remove the jack and load it into a pickup truck or other vehicle.

Building piers

During the time that the girders were being built, work was progressing on the piers and abutments of the bridges. Each of the bridge piers consists of eight Union Metal 14-inch steel piles driven to bearing in the ground and extending up above ground to the concrete caps.

These heavy, corrugated steel pile shells, ranging from 40 to 55 feet in length were driven by a crane with a Vulcan No. 1 steam hammer. Steam was supplied by a Bros steam generator.

When the eight piles in a bent had been driven to bearing, cut off to grade, and filled with concrete, forms were built for a cast-in-place concrete cap 42 inches wide, 4.5 to 5 feet deep, and 30 feet long.

Each of the bridge abutments was supported on 15 treated timber piles, 55 feet long, which were driven by the same equipment. These piles were first jetted down about 15 feet with a water jet supplied by a Jaeger jetting pump, then driven to bearing. The abutments were formed and cast in place.

The crane set the prestressed girders in place on the completed piers and abutments, one span at a time, and the deck was formed and cast in place. Plyform $\frac{3}{4}$-inch deck forms, backed by 2×6 joists, were suspended from the tops of the girders with Superior joist hangers. Diaphragms between the girders were formed and cast with the deck. The deck is a $6\frac{1}{4}$-inch slab spanning between the girders to provide a finished roadway 28 feet wide. The edge curbs are 10 inches high and 15 inches wide and are surmounted by steel railings.

Traffic was routed over the new bridge and grade late last year, and the road is remaining open this summer while bituminous surfacing is being completed.

Personnel

Representing the Wisconsin State Highway Commission on the project were resident engineer D. B. Dempsey and area engineer A. J. Engelke. District engineer V. L. Fiedler of the La Crosse District supervised the project. S. E. Hicks is engineer of construction and E. L. Roettiger is state highway engineer for the Wisconsin Commission.

The superintendent for Brogan Construction Co. was Harold Hansen, and the assistant superintendent was Gunner Hansen. Supervising the post-tensioning operations for Steel Crete Construction Co. was John Hufschmidt. THE END

As the post-tensioned girders are set in place, six to a span, forms are set for the diaphragms and deck of the bridge. Deck forms consist of $\frac{3}{4}$-inch Plyform backed by 2×6 joists and supported from the girders on Superior joist hangers.

Complete Line of Homelite Carryable Construction Equipment Now Available

Self-Priming Centrifugal Pumps . . . Carry these lightweight, dependable pumps anywhere. Non-clogging design . . . 28 foot suction lift . . . capacities up to 15,000 g.p.h. . . . sizes from $1\frac{1}{2}$" to 3". Diaphragm pump also available.

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NEW JOYCE YELLO-JACKIT LIFTMASTER
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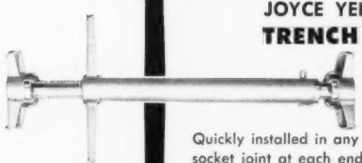
Rugged, precision-built models of 5 to 20 tons capacity, properly balanced for easy carrying.



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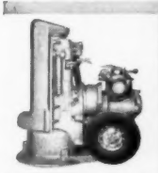

JOYCE YELLO-JACKIT
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...and to complete Joyce's labor saving Jack Line .....

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CANADA: Midland Foundry & Machine Co., Ltd., Midland, Ont.

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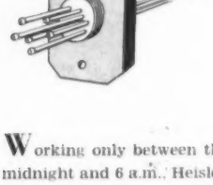
Two P&H Model 555 truck cranes, of 35-ton capacity, set another of the 119-foot-long girders in place. The units, cast in place at the site, were brought about 1,000 yards to the bridge by a truck-tractor and dolly.

Overpass girders erected in four 6-hour night shifts

Traffic is diverted only between hours of midnight and 6 a.m. so that 18 girders, prestressed at site, can be positioned



Working only between the hours of midnight and 6 a.m., Heisler & Woods, El Monte, Calif., took only four nights to erect 18 prestressed-concrete bridge girders for the Balboa Street crossing of the Ventura-San Diego Freeway in southern California. On the best night, six of the girders were erected.

The L-shaped girders, weighing 62 tons each, are 119 feet long, 5.5 feet high, and about 30 inches wide on the top flange. The 18 units were placed side by side at 5.5-foot centers to support the integral concrete deck, which was later cast in place.

Girders cast at site

The girders were constructed near the site by E. L. Parker Co., Claremont, Calif., under a subcontract to Oberg Bros. Construction Corp., Inglewood, Calif., the general contractor for this section of the freeway. Al Hopton was superintendent for Heisler & Woods on erection work.

The period between midnight and 6 a.m. was chosen for the erection operation since it was possible to divert traffic during these hours. Actual placing operations started as a P&H Model 555 35-ton truck crane picked up one end of the girder at the casting bed and placed it on a special 12-wheel dolly attached to the front of a GMC truck. Two 12-inch double-coil Superior pickups, $1\frac{1}{4}$-inch in size, anchored the lifting attachment in the beam. An equalizer between the two pickups assured a perfectly vertical lift with the crane's 6-part line. The other end of the girder was placed on a truck-tractor by another P&H crane.

Both trucks carried the girder about 1,000 yards to the bridge site. Here, they jackknifed the girder across the road so that the unit was approximately below its final resting place.

Position girder

Then the two P&H 555 truck cranes picked up the girder, freeing the

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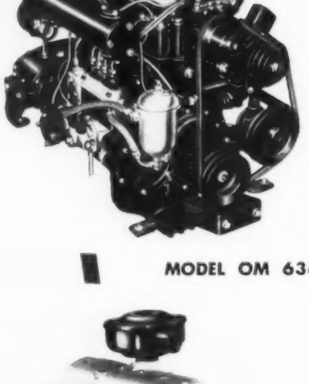
Diesel



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OM 312	6	79 @ 2400
OM 321	6	96 @ 2600
OM 315	6	123 @ 1800
M 204 B	4	129 @ 1200
†MB 846 A	6	242 @ 1500
†MB 846 Ab	6	320 @ 1500
MB 836 B	6	360 @ 1500
MB 846 Db	6	375 @ 1500
MB 837 A	V-8	451 @ 2000
MB 836Bb	6	513 @ 1500
MB 837 Aa	V-8	564 @ 2000
MB 836 Db	6	666 @ 1600
MB 820 B	V-12	718 @ 1500
MB 820 Bb	V-12	1026 @ 1500
MB 820 Db	V-12	1385 @ 1500

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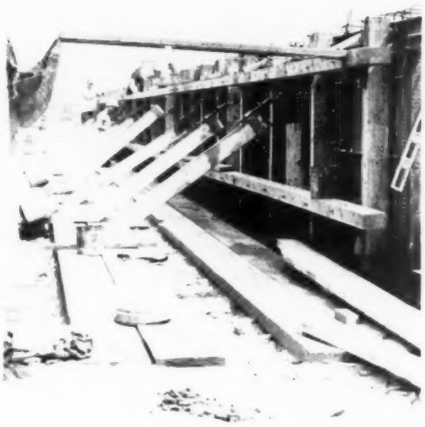
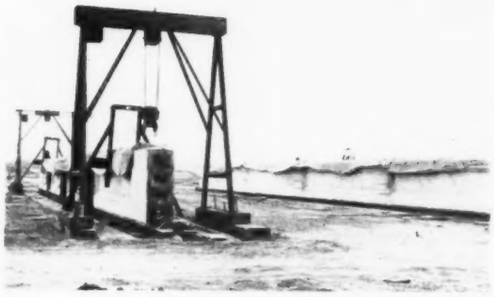
trucks and the dolly. One crane remained in position and raised its end of the girder to the seat. The other crane moved from 20 to 30 feet, carrying the load.

To aid in this operation, Heisler & Woods fitted the crane with a shop-made rolling outrigger. Two 14-inch hard rubber wheels were on a rocking beam at the end of each outrigger, enabling the crane to pick up the load and walk with it. The wheels were planked across the dirt area alongside the pavement.

As soon as a girder had been set in final position, both cranes headed back to the casting bed to load another girder. THE END

A list of coming conventions appears on page 83 of this issue.





Workmen prepare formwork (left) for a 40-ton, 95-foot-long concrete beam, one of 15 such units cast and post-tensioned by C. F. Lytle Co. for an overpass in Sioux City. After the pour, beams are stripped of forms and kept wet with tarpaulins soaked with water (above) while curing.

Post-tensioning 95-foot beams for concrete overpass in Iowa

An interesting feature of C. F. Lytle Co.'s $1,374,891 contract for a cloverleaf in Sioux City, Iowa, connecting U. S. 20 with the Combination Bridge across the Missouri River to South Sioux City, Nebr., was casting and post-tensioning of 95-foot-long concrete beams to be used in the overpass spanning the Interstate highway.

Fifteen of these 40-ton beams were cast at the work site. The units are 4 feet 6 inches deep and 1 foot 8 inches wide. Ten $1\frac{1}{8}$-inch-diameter tensioning rods in each beam were stressed to 100,000 psi in the post-tensioning process.

In addition to these overpass beams, the Sioux City contractor cast and post-tensioned two smaller sizes for use in enclosing a creek which will run underneath the cloverleaf on its way to emptying into the river. A total of 147 of these conduit beams was cast, either at the site or at a casting bed located at Lytle's maintenance shop and equipment yard about five miles from the project site.

The smaller beams are 52 feet 6 inches long. One size is 2 feet 6 inches deep and 3 feet 3 inches wide; the other is 3 feet deep and 3 feet 3 inches wide.

Stressteel post-tensioning tendons and anchor assemblies are used in all the sizes, and Simplex hydraulic jacks were used to tension the rods. Comparatively little reinforcing steel was used in the beams.

Concrete was placed in the forms with a front-end loader mounted on a Case tractor. The loader was adapted by Lytle's shop to accommodate a concrete hopper.

The new overpass will replace the first span of the Combination Bridge, which is being removed as part of the project, and thus provide direct access to the bridge from U. S. 20, which runs parallel to the river at that point.

Reo Motors opens new branch office

Reo Motors Division, White Motors Co., Lansing, Mich., has opened a modernized branch office at 4119 Spring Grove Ave. in the Cumminsville automotive district of Cincinnati, Ohio. The building now has a floor space twice its previous size.

G. E. Briggs is the branch manager.

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and built to the highest standards of quality, performance and economy. . . Unusually long engine life and dependable operation under extreme climatic conditions are made possible by their exclusive design. . . The sales and service program for Mercedes-Benz diesels, now being established by Utica-Bend, provides for sales representation in key areas and facilities for servicing of engines and distribution of spare parts to assure full maintenance of equipment in the field. . . For further information, write to: UTICA-BEND DIVISION, CURTISS-WRIGHT CORPORATION, UTICA, MICHIGAN.

	WEIGHT LBS.	APPROXIMATE DIMENSIONS		
		LENGTH	WIDTH	HEIGHT
	400	2'5"	1'9"	2'6"
	808	3'1"	2'2"	3'5"
	784	3'1"	2'2"	3'5"
	1775	4'6"	2'3"	3'11"
	2715	4'9"	2'7"	3'11"
	4075	6'2"	2'8"	5'
	4298	7'2"	3'1"	5'2"
	3560	6'4"	3'5"	4'7"
	4266	7'0"	2'10"	5'2"
	2970	4'1"	3'5"	3'6"
	4080	7'	3'5"	5'4"
	3080	4'2"	3'5"	3'8"
	4290	7'6"	3'5"	5'4"
	5510	8'	4'5"	6'1"
	6116	7'11"	4'5"	6'5"
	6612	7'11"	4'6"	6'1"

CHANICAL SUPERCHARGER † AVAILABLE IN HORIZONTAL CONFIGURATION

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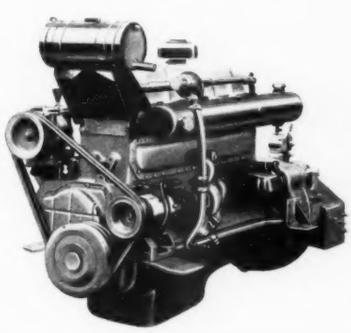
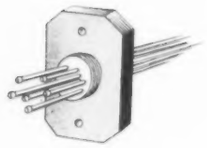


MODEL OM 315

UTICA-BEND DIVISION
CURTISS-WRIGHT
CORPORATION • UTICA, MICHIGAN

For more facts, use Request Card at page 18 and circle No. 277



The small-scale casting bed set up at the Raleigh, N. C., pipe and block plant was built first. It has a working length of 100 feet. Double-tee forms, furnished by Heltzel, are at right; a double line of 12-inch piling forms are in the center; octagonal piling forms are on the left.

Concrete products firm grows with prestressing operation

A concrete pipe and block manufacturing outfit is now working full blast on a new and profitable venture—the commercial production of prestressed-concrete components. Operating under a franchise from Leap Concrete, Inc., Lakeland, Fla., N. C. Products Corp. has seen its prestressing operations grow swiftly since it started this work last summer.

Small bed added first

Starting in the pipe business with only one machine, the firm first expanded into concrete-block manufacturing. The prestressing operation was opened at a small yard at its Raleigh plant, but it was only recently that the firm opened its large-scale prestressing branch at Durham.

The small-scale pilot casting bed was set up first at the Raleigh pipe and block plant for two reasons. First, there was no room at the Raleigh site for a long, large bed. Second was the big initial expense involved in setting up even a small yard for the new and unfamiliar operation. The steady upswing in the use of prestressed components—and in N. C. Products' business—has made the risk worth while.

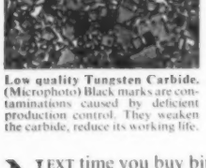
Pilot prestress plant

Leap Concrete, under the franchise agreement, furnished N. C. Products with the plans and specifications for the construction of the present yard at the Raleigh plant. The one small bed, having an effective working length of 100 feet, combines a double-tee bed with a flat, universal bed. The flat-bed section, built right next to the double-tee bed, is capable of turning out 400 feet of 12-inch rectangular piles or 100 feet of 20-inch octagonal piles and 200 feet of 12-inch piles.

Heltzel double-tee steel forms, placed when the double-tee bed was formed, are embedded in the concrete. These forms are generally bolted to the casting bed so that they can be removed and the bed made more flexible. The bolting feature has been used for the bigger

Longer bit life—with *new* Sandvik Coromant X-Bits

Sandvik Coromant Tungsten Carbide. (Microphoto) Uniformity of size, even distribution of grain are marked. Free from porosity and impurities—therefore stronger, longer-lived.



Low quality Tungsten Carbide. (Microphoto) Black marks are contaminations caused by deficient production control. They weaken the carbide, reduce its working life.

NEXT time you buy bits, specify Sandvik Coromant because they give you more footage per bit, lower drilling costs. Here's why:

1 Only first-quality tungsten carbide is used—as shown in the microphotos above. This means less wear, longer life and a better job.

2 the bodies are precision-made of high quality alloy steel—tough enough to take the strain throughout the extra-long bit life.

3 the bigger Sandvik Coromant bits are all of X-design, which prevents rifling. No wonder Sandvik Coromant inserts are the most widely used in the world, drilling more than one billion feet every year.

	THESE STANDARD SIZES ARE AVAILABLE	
	THREAD	DIAMETERS AVAILABLE (IN INCHES)
SHOULDER TYPE	7/8" F	1½
	1" H	1½, 1⅝, 1¾ and 1⅞
	1 3/16" D	2, 2⅛, 2¼, 2⅜, 2½, 2¾ and 3
	1 11/16" K	3, 3½, 4 and 4½
BOTTOMING TYPE	1¼" Rope	1⅞, 2, 2¼, 2½, 2¾ and 3
	2" Rope	3½, 4, 4½ and 5
	400	2, 2¼ and 2½
	600	2½, 2¾, 3 and 3½

The sizes underlined are X-shaped bits

SANDVIK COROMANT bits are supplied through Atlas Copco, the world's largest manufacturer of rock drills, who also supply Sandvik Coromant integral steels—the most widely used in the world—cross bits from 1¼" to 2½" and extension steel equipment.

Write, phone or cable today for further details to any of the addresses below:

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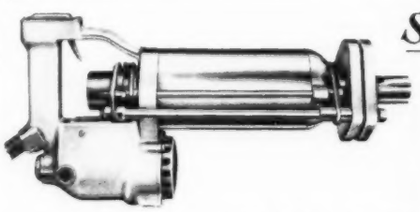
EASTERN — *P.O. Box 2568 Paterson 25, N.J. Phone — Armory 4-3310*
PACIFIC — *930 Brittan Avenue, San Carlos, Calif. Phone — Lytell 1-0375*
CANADA — *Montreal Airport, Quebec. Phone — Melrose 1-1871*
MEXICO — *Apartado Postal 56, Torreon, Coahuila. Phone — 39-07*

DST-78

For more facts, use Request Card at page 18 and circle No. 278



SYNTRON ELECTRIC HAMMER DRILLS

The only Electric Hammers available with automatic bit rotation

SYNTRON Electric Hammer Drills are designed for fast easy drilling in concrete. SYNTRON'S exclusive automatic rotation of drill bits provides ease of handling in any drilling position. Constructed for long, dependable service, employing the electromatic principle, they will maintain their efficiency with a minimum of maintenance. Operation from 115 volts A-C light line. Capacities from 5/8" to 2" diameter holes.

GASOLINE HAMMER ROCK DRILLS

VIBRATORY COMPACTORS

VIBRATING CONCRETE FLOATS

Write for complete tool catalog — FREE!

SYNTRON COMPANY
227 Lexington Ave. Homer City, Pa.

For more facts, use Request Card at page 18 and circle No. 279

Successful concrete pipe and block manufacturer makes new addition a profitable and growing line

Braced against the embedded steel uprights, a Rodgers 200-ton hydraulic jack pushes against the jacking frame that pulls the strand template. An overhead hoist is used to position the jack at one of the three positions on the casting bed.

setup at the Durham branch.

Also embedded in the concrete of the double-tee bed are two supply and two return pipelines which circulate hot water through the bed to decrease curing time and keep concrete from freezing during the winter months. These lines along both sides of the double-tee stems are located at mid-depth of the slab. Though calcium chloride is added to the concrete mix during the winter months also, the circulating hot water is usually sufficient for curing the double-tee pours swiftly.

Eight 1-inch lines are embedded in the flat-bed section of the casting bed to circulate hot water throughout the slab. These four supply and four return lines also help decrease the curing time required for the piles. After pouring operations, all the forms are covered with burlap and soaked with water 16 to 18 hours during the curing process.

Once forms have been set, prestressing operations begin with two

(Continued on next page)

For more facts, circle No. 280→

DUDGEON HYDRAULIC JACKS

SALES RENTALS

CAPACITY TO 600 TONS

FOR:
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UNDER-PINNING
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BRIDGES
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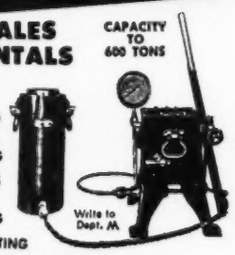
SOIL TESTING



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For more facts, circle No. 281

NEW self-propelled Utility Scraper self-loads 6 yards!

Now you can get a self-propelled scraper sized and priced to help you make a profit on small earthmoving jobs, and cut clean-up costs on big projects

The new Seaman-Gunnison Utility Scraper is *designed* and *priced* for profitable earthmoving where you simply can't afford to tie up a big rig. It's equally a timesaver and cost-cutter for clean-up work on big projects.

You move quickly from yard to site, from job to job . . . *no permits needed!* Simply drive the Seaman-Gunnison Utility Scraper through city traffic or on paved highways under its own power, up to 21 mph. At the job, bite in and heap a self-loaded 6 cu yd. Spread inches-thin or eject the whole load in an instant. If ground is extra hard, lower the built-in scarifier and rip for the next cut!

The new Seaman-Gunnison Utility Scraper for self-loading is powered by an International 650 Diesel tractor, modified as an 88-hp prime mover. At still lower cost, get an International 65 hp W 450 Diesel prime mover, and push-load in difficult soils. All steering and scraper controls are hydraulic. You can turn 180° in 22 ft, 2 inches. Overall width and axle loadings are well within limitations for self-transport and hauling on streets and highways. WRITE, WIRE, or PHONE for descriptive folder and name of your Seaman-Gunnison Construction Equipment Distributor.

Team the Utility Scraper (interchangeable W 450 prime mover) with a Seaman-Gunnison DUO-PACTOR, giving you the *lowest cost system ever devised* for utility earthmoving, compaction, surface rolling, and seal coating!

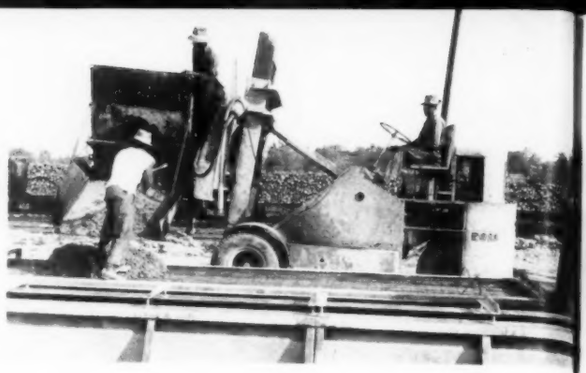
Utility Scrapers and Duo-Pactors are developments of Harry J. Seaman, pioneer in soil stabilization equipment and techniques for more than 20 years, and are manufactured only by Seaman-Gunnison Corporation.

SEAMAN GUNNISON CORPORATION

- Utility Scraper
- Duo-Pactor
- Duo-Flo Bituminous Distributors

Dept.CE-9, 2763 S. 27th St., Milwaukee 15, Wis.

A frame, made of steel plates, maintains the proper spacing of strands for octagonal piles. Four threaded rods connect the frame to the jacking frame that is pushed by the hydraulic jack during stressing operations.



A Ross fork-lift with a company-built hopper delivers concrete to the Heltzel double-tee forms. The hopper has a lift gate to control the flow of concrete being chuted to the forms.

pretensioning strands being pulled manually from the reels mounted at the dead end of the casting bed and carried simultaneously to the live or jacking end of the bed. The Roebling and Union $^3/_8$-inch or 7/16-inch pretensioning strands are first passed through a template at the dead end of the bed before being pulled through to the jacking end. At this live end, the strands pass through a frame consisting of horizontal steel plates that maintain the proper spacing of the strands. Self-locking Europa strand vises fasten the strands to the frame, which rides on steel channels. Four threaded rods and bolts connect this frame to a jacking frame which takes the thrust of the hydraulic jack during stressing operations. As this jacking frame is being pushed by the jack, it pulls the strand template frame on the opposite side of the casting bed braces.

These braces are made up of six 24 WF 120 steel sections, about 20 feet long, embedded in the concrete abutments at either end of the flat-bed section. Only $3^1/_2$ feet of these steel sections are above the surface of the buried concrete abutments. These exposed lengths, which act as the jacking brace, were reinforced with 24-inch steel channels before being encased in concrete. The 8-foot 8-inch-wide flat-bed slab varies in thickness from 6 inches along most of its length, to about 2 feet near the end abutments. Along the outer edge of the flat bed, the thickness is about 18 inches for a width of 1 foot.

The adjoining double-tee bed, which is 5 feet wide and 12 inches thick, has three 16 WF 20 steel sections at each end encased in concrete. There are three jacking positions for the entire casting bed—one for the double-tee bed and two for the flat-bed section. When only 12-inch piles are being cast, the flat bed can accommodate 4 lines—a jacking position for each pair of lines. When a line of octagonal piles is being cast, only two lines of 12-inch piles can be produced. The two jacking positions are then used—one for the octagonal line and one for the double line of rectangular piles.

Stress applied

After all the pretensioning strands are in place and connected to the dead and jacking ends of the casting bed, a 3,000-pound pull is applied to each strand. This makes the strands taut and removes any kinks or irregularities in them. This initial load is placed by a ratchet wrench, which measures the amount of applied pull by means of a company-rigged spring scale. This load placed on each strand, the Europa strand vises are readjusted against the strand frame.

A single Rodgers 200-ton hydraulic jack powered by a Rodgers electric motor is then positioned between the brace and jacking frame to stress the cables. The jack is brought to the three jacking positions by a hoist riding the bottom flange of an overhead beam. The amount of stress applied to each strand simultaneously is determined by the elongation of the ram of the jack.

Once the desired strand elongation

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ESTABLISHES NEW RECORDS BY MOVING IGH

Out on the job these specially designed Autocars are beating every claim we made for them. Rated at 15 tons, they haul their huge loads at top speeds up to 39 mph. And their combination of fast axle ratios with a 10-speed transmission permits them to operate at higher speeds on up-grades, too. Whether they're at work on road construction or in a quarry, they're doing the job faster and more efficiently than ever before.

Concrete poured over the wire-mesh reinforcing in the double-tee forms is consolidated by Viber electric vibrators. N. C. Products Corp. is doing all its prestressing work under a franchise from Leap Concrete, Inc., Lakeland, Fla.

The newer casting bed at the Durham, N. C., branch is longer and more modern than the one at Raleigh. It also has more flexibility, since the double-tee forms are bolted to the casting bed instead of being cast integral with it. At present it is being revamped to handle the pretensioning of draped strands.

is reached, jacking is stopped and the nuts of the four threaded rods connecting the jacking frame and the end template are tightened against the brace. This transfers the load from the jacking frame to the brace against the embedded steel uprights. This maintains the load, allowing the Rodgers jack to be removed.

With the strands in tension, the forms are waxed with Poco soluble compound prior to the placement of concrete. This is done so that forms can be stripped easily.

Concrete, furnished by one of the batch plants of the pipe and block plant, is hauled to the casting bed by a Ross fork-lift equipped with a $1\frac{1}{2}$-cubic-yard hopper. This hopper, built by the company, uses a chute to dump concrete into the forms and has a lift gate to control the flow of the mix. Viber electric vibrators are used to consolidate the pours.

After the 16 to 18-hour curing process, concrete test cylinders are tested to determine whether or not the required strength has been reached. The piling cylinders must reach a strength of 3,500 psi and the double-tee cylinders, 4,000 psi, before the strands can be detensioned.

Detensioning is done by replacing the hydraulic jack and reversing the jacking operation so that the applied load on the strands is gradually reduced. An electric-arc welder is used to cut the cables between the piles or double-tee lengths formed by the bulkheads. The detensioning of the octagonal piles is done after the forms have been unbuttoned and moved away from the sides of the piles. The double-tee Heltzel forms and the rectangular pile forms made by the Durham Brazing & Welding Works, Durham, are constructed in such a way that they do not have to be unbuttoned before detensioning is done.

The casting yard in Durham, having a much longer and more up-to-date casting bed, is now in the process of being revamped to handle the pretensioning of draped strands—a job which is still a problem to many outfits. Here, as in the Raleigh yard, N. C. Products uses a Gerlinger 30,000-pound-capacity fork-lift with a 50-foot-long stiff-back truss attachment to lift completed components from the forms.

Personnel

H. M. Shaw is the general manager of North Carolina Products Corp. James McKee is assistant general manager and sales manager. J. Jack Andrews, mechanical engineer and purchasing agent, helped in the design of both of the prestressing beds. George Berson has charge of all prestressing designs, technical matters and research. In charge of sales, production, delivery and erection for the prestress department is Mial Williamson. M. E. Harmon is superintendent of the Durham plant.

THE END

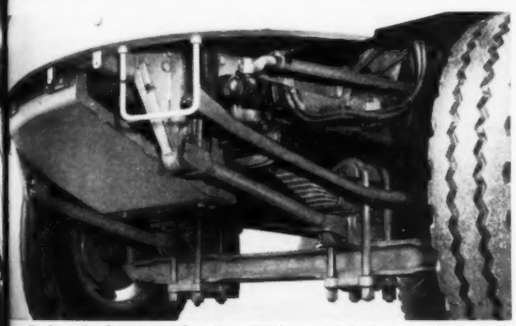
Thor buys Drying Systems

Thor Power Tool Co., Chicago, Ill., has acquired Drying Systems, Inc., Chicago. Drying Systems, producer of industrial ovens and process air-conditioning installations, will operate as a division of Thor.

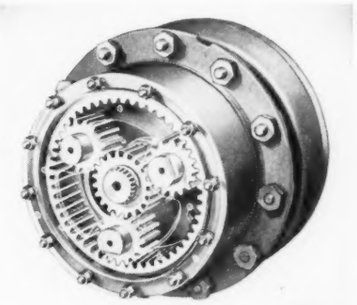
Autocar AP-15

IGHTY LOADS ON A FASTER TRIP CYCLE

Yes. The AP-15 is designed to do the job better



ne, Radius Rods, Free-Floating Springs. Reinforced, alloy steel e with bolted construction is rigid enough to keep components in e and flexible enough to absorb torsional stresses. Heavy-duty radius s, front and rear, hold axles in alignment with frame. Free-floating gs absorb road shocks and assure long tire life.



Planetary-Gear Rear Axle. The AP-15 is built around this basic component because it delivers the torque from the powerful Diesel engine all the way back to the rear wheels. In fact it places the highest numerical gear reduction right in the wheels, thus decreasing torque load on axles and differential. It assures long gear and shaft life and makes the units transmitting power as strong and dependable as the rest of this giant truck.

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is Autocar rewrites the book of rules for profitable ling of fill, aggregate, rock and similar materials. fore you buy your next truck, it will pay you to talk your White-Autocar Distributor about the rugged, werful AP-15.

Autocar Driver Cab, Power Steering. Designed and built to provide maximum comfort as well as strength and durability, the Autocar Driver Cab permits the driver to put in a full day without undue fatigue. Full hydraulic power steering makes this monster truck as easy to handle as a passenger car. The unique "Full-Adjust" seat allows the driver to find his own most comfortable position.

White Autocar

AUTOCAR TRUCKS

AUTOCAR DIVISION · The White Motor Company
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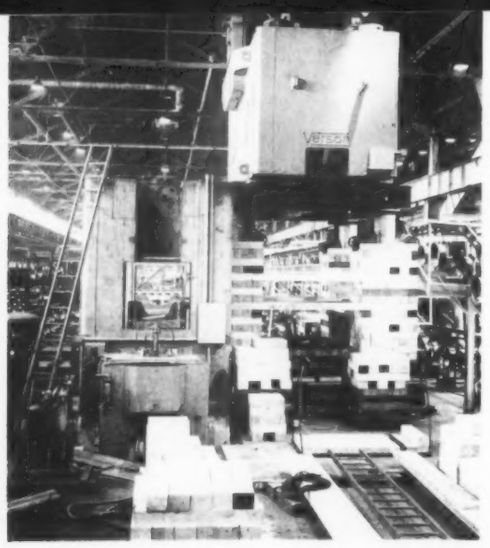


The 200-ton crown section is supported by eight Duff-Norton air motor screw jacks—two in each corner. One jack in each corner made a lift while the extra jacks were blocked. Alternate use of each set of four jacks raised the machine.

Jacking system a notch better than gantry and rigging for big machinery lift

Adopting unusual methods to handle an unusual job, the Pittsburgh, Pa., contracting firm of Eichleay Corp. used jacks rather than a gantry and rigging to raise a 200-ton piece of equipment into place for the McKeesport, Pa., plant of Kelsey-Hayes Co.

The 200-ton crown assembly had to be raised 17 feet and set atop a 3,000-ton-capacity transfer press, but the use of a gantry and rigging was ruled out immediately because the lift had to be made without tying up nearby production stations in the plant.

The erection technique developed by Eichleay made it possible for the job to be done without disrupting production and in five instead of the seven days' time estimated for the work.

Eight 100-ton air motor screw jacks, designed by Duff-Norton Co., Pittsburgh, were used to make the lift. Two jacks were positioned under each corner of the 10-foot-high, 10-foot-wide, and 22-foot-long crown.

Four of the jacks—one under each corner—were raised simultaneously about 14 inches while the other set of four was blocked. Raising and blocking each set of four jacks alternately, the contractor had the crown 8 inches above the 16-foot height of the stands in less than ten hours.

With the crown raised, it was a relatively simple job to pull the crown and falsework into place with the aid of rollers. Then the crown was lowered onto the stands and the falsework removed.

Spared two problems

Two problems were eliminated by the use of the jacks, which were operated with an air pressure of 100 pounds from a receiver tank on the plant line, though they require only 80 to 90 pounds pressure to raise capacity loads. First, when these mechanical screw jacks were locked into place, there was no danger of their creeping under load. When the full limit of the raise was reached, the air motor was stopped by an automatic shut-off device. A safety keyway in the ram kept the head from turning and shifting under load. If the gantry and rigging had been used, there would have been a danger of a cable breaking and the rigging collapsing.

Second, if the gantry method had been used, it would have been necessary to remove part of the plant roof to tie the crown down to the stands. Four 9-ton rods that are 14 inches in diameter and 38 feet long were used for this purpose. These rods were sunk through the plant floor into the basement. After the stands and crown had been erected, the rods were pulled up through holes in the stands and crown. THE END

New Pennsylvania Turnpike Tunnel Links Philadelphia and the Poconos

A major link in the Northeastern Extension of the Pennsylvania Turnpike between Philadelphia and the North is the new Lehigh Tunnel through the Blue Mountain west of Palmerton, Pa. The tunnel is 4,379 ft long, and provides for two lanes of traffic, separated by a concrete divider. The interior finish is tile, and illumination is furnished by some 800 fluorescent lights.

In all, more than 37,000 cu yd of concrete were placed in the tunnel, including the roadbed. Bethlehem supplied a number of steel products for the tunnel as well as for all sections of the Turnpike, including reinforcing bars, bar mats, dowel units and other highway steels.

The Northeastern Extension of the Turnpike starts at Plymouth Meeting and presently extends to Wilkes-Barre. It provides access between the Philadelphia metropolitan area and the industrial, farming, and Pocono Mountain resort areas to the north.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

For more facts, use Request Card at page 18 and circle No. 283

Aero Design appoints

Tom Harris has been appointed director of marketing for the Aero Design & Engineering Co., Bethany, Okla. Harris was formerly with American Airlines.

Convention calendar

September 9–11 Associated General Contractors of America, Inc.
Mid-year Board Meeting, Olympic Hotel, Seattle, Wash. Wm. G. Dooly, Jr., public relations director, AGC, 1227 Munsey Bldg., Washington 4, D. C.

September 17–19 Increasing Highway Engineering Productivity
Fourth Conference, Somerset Hotel, Boston, Mass. H. A. Radzikowski, chief of development, Bureau of Public Roads, Washington 25, D. C.

September 22–25 American Public Works Association
Public Works Congress and Equipment Show, Benjamin Franklin Hotel, Philadelphia, Pa. D. F. Herrick, executive director, APWA, 1313 E. 60th St., Chicago 37, Ill.

September 22–25 American Society of Mechanical Engineers
Twelfth Annual Petroleum Mechanical Engineering Conference, Mayo Hotel, Tulsa, Okla. Carl A. Stevens, ASME, 1932 N. Boston Ave., Tulsa, Okla.

October 1–3 Southeastern Association of State Highway Officials
Meeting, Dinkler Plaza Hotel, Atlanta, Ga. F. L. Ackerson, assistant construction engineer, SASHO, Georgia State Highway Department, 2 Capitol Square, Atlanta 3, Ga.

October 1–4 National Association of Corrosion Engineers
Meeting of North and South Central Regions, Sherman Hotel, Chicago, Ill., and City Auditorium, Oklahoma City, Okla., respectively. A. B. Campbell, executive secretary, NACE, 1061 M & M Bldg., Houston 2, Texas.

October 2–4 American Society of Photogrammetry
Meeting, Chase Plaza Hotel, St. Louis, Mo. C. E. Palmer, secretary and treasurer, ASP, 1515 Massachusetts Ave. N. W., Washington 5, D. C.

October 7–10 American Institute of Steel Construction
Meeting, Hotel Del Coronado, Coronado, Calif. L. A. Post, executive vice president, AISC, 101 Park Ave., New York 17, N. Y.

October 8–11 Ohio Short Course on Roadside Development
Meeting, Departments of State Building, Columbus, Ohio. Chas. R. Sutton, OSCRD, Brown Hall, Ohio State University, Columbus, Ohio.

October 9–11 National Slag Association
Annual Meeting, Plaza Hotel, New York, N. Y. E. W. Bauman, managing director, NSA, 613 Perpetual Bldg., Washington 4, D. C.

October 14–18 American Society of Civil Engineers
Annual Convention, Statler Hotel, New York, N. Y. D. P. Reynolds, assistant to the secretary, ASCE, 33 W. 39th St., New York 18, N. Y.

October 17–19 National Society of Professional Engineers
Fall Meeting, Grand Pacific Hotel, Bismark, N. Dak. Kenneth Trombley, NSPE, 2029 K St. N. W., Washington 6, D. C.

October 21–23 American Concrete Pipe Association
Seventh Annual Short Course School of Instruction, Chase Hotel, St. Louis, Mo. Howard F. Peckworth, managing director, ACPA, 228 N. La Salle St., Chicago 1, Ill.

October 21–25 National Safety Council
Forty-fifth National Safety Congress and Exposition, Conrad Hilton Hotel, Chicago, Ill. R. L. Forney, secretary, NSC, 425 N. Michigan Ave., Chicago 11, Ill.

October 24–25 Computer Applications Symposium
Meeting, Sherman Hotel, Chicago, Ill. Conference secretary, Armour Research Foundation, Illinois Institute of Technology, 10 W. 35th St., Chicago 16, Ill.

October 28–30 American Road Builders' Association
Fifth Annual National Highway Conference for County Engineers and Officials, French Lick Sheraton Hotel, French Lick, Ind. Ben F. Ostergren, managing director, County and Local Roads Division, ARBA, World Center Bldg., Washington 6, D. C.

October 28–30 National Lubricating Grease Institute
Annual Meeting, Edgewater Beach Hotel, Chicago, Ill. T. W. Miller, executive secretary, NLGI, 4638 J. C. Nichols Parkway, Kansas City 12, Mo.

October 29–30 American Concrete Institute
Meeting, Ben Franklin Hotel, Seattle, Wash. William A. Maples, secretary-treasurer, ACI, P. O. Box 4754, Redford Station, Detroit 19, Mich.

October 29–31 Navy Bureau of Yards and Docks
Symposium on Construction Cost Reduction Through Creative Design and Engineering, U. S. N. Civil Engineering Research and Evaluation Laboratory, Port Hueneme, Calif. Commanding Officer, U. S. Naval Construction Battalion Center, Port Hueneme, Calif., Attn: Code 15.

October 30 – November 1 Virginia Highway Conference
Meeting, Virginia Military Institute, Lexington, Va. R. P. Ellison, executive assistant, VHC, 1221 E. Broad St., Richmond, Va.

November 10–16 American Society of Sanitary Engineering
Meeting, Lauderdale Beach Hotel, Fort Lauderdale, Fla. Frank Warren, general chairman, ASSE, 818 N. E. First Ave., Fort Lauderdale, Fla.

November 12–14 National Association of Corrosion Engineers
Fall Meeting, Northeast Region, Penn-Sheraton Hotel, Pittsburgh, Pa. A. B. Campbell, executive secretary, NACE, 1061 M & M Bldg., Houston 2, Texas.

November 15–22 American Association of State Highway Officials
Meeting, Conrad Hilton Hotel, Chicago, Ill. A. E. Johnson, executive secretary, AASHO, 917 National Press Bldg., Washington 4, D. C.

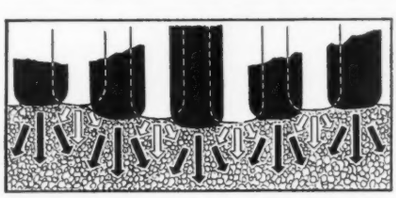
November 18 Cleveland Engineering Society
Sixth Annual Construction Conference, Cleveland Engineering Society, Cleveland, Ohio. Edward Wolfson, chairman, CES, 2136 E. 19th St., Cleveland, Ohio.

Lowbowl principle explained in film

Caterpillar Tractor Co., Peoria, Ill., has released an $8\frac{1}{2}$-minute, 16mm film, "The Lowbowl Story", to explain the Lowbowl concept in scraper design. The film emphasizes that this scraper gets loads faster, because it is longer, lower, and wider.

The film is available from Caterpillar dealers or from the advertising division of the company.

How oscillating wheels can save you untold street maintenance costs...



See the flow of compaction effort that the BROS Self-Propelled roller **with torque converter drive** provides for street seal coating, resurfacing and shallow lift compaction...

Here's how it is helping cities throughout the country make great savings in street maintenance costs:

- With full oscillation of all wheel pairs to provide uniform compaction, the BROS SP-54 helps "key" and "lock" aggregate materials tightly in the base course to prevent various pavement failures.
- Wheel oscillation of this roller also kneads the asphalt into a tight, solid surface, eliminating hairline cracks that would otherwise turn into surface breaks. Very important, too, rubber tire rolling correctly imbeds the wearing course chips *without* crushing them.
- Besides such proven advantages, the BROS SP-54 offers these time-saving performance features: a torque converter drive provides smooth, easy handling and eliminates "tipping" of chips when starting; it also lessens drive line strain.
- Full-reversing type transmission with shuttle gear permits rolling in either direction without shifting; turn arounds are thus eliminated.
- Infinite speed range from 0 to 18 mph; positive chain drive to both rear wheel pairs; 50 HP engine and smooth, hydraulic steering provide fast, proper compaction results that you can't get from any other roller. See a BROS Distributor or write us for full information and/or a demonstration.

Find out, too, about the complete BROS TEAM. With the SP-54, the BROS Preparator and Roto-Mixer make the perfect combination for low cost street construction. The Preparator (in-place materials reducer) reduces native over-size materials and old blacktop to proper roadbed sizes. The Roto-Mixer stabilizes and blends the base and wearing course materials to improve load bearing values.

75TH YEAR

ROAD MACHINERY DIVISION

BROS INCORPORATED

(Formerly the WM. BROS BOILER & MFG. CO.)

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BROS

For more facts, use Request Card at page 18 and circle No. 284

Triangular haunches carry center-pinned roof trusses for new city sports arena

The unique sports arena at Evansville, Ind., is now luring fans to view sports events, ice shows, and exhibitions and also to inspect the building itself. The structure has a free span of 267 feet 4 inches and a depth of 312 feet 4 inches. The clear-span structure was designed by Ralph Legeman & Associates, built by Thorp Construction Co., and erected by Midwest Erection Co., all of Evansville.

The basic, non-rigid framework has eight center-pinned trusses supported at either end by huge, triangular 14-ton beam and plate haunches. The trusses are only 39 feet off grade at their highest point at the center pin. The side haunches are just 27 feet high at the top beams where they connect with the top chords of the trusses.

To provide adequate ceiling height inside, the interior was excavated 19 feet 3 inches deep. Thus, the arena floor was depressed. Seats are on concrete steps poured down from grade level. Permanent seats will accommodate 7,500 spectators, and there is room available for 4,000 temporary bleacher seats.

Truss design

Unusually heavy structural sections were specified in haunches and trusses. For example, vertical members of the haunches, weighing 426 pounds per foot, are wide-flange H-beams that have an $18\frac{3}{4}$-inch section depth, $16\frac{3}{4}$-inch flange width, and 3 1/6-inch flange thickness. These members carry the principal load from the trusses and are hinged at the base foundation with $6\frac{1}{2}$-inch round pins to allow rocking in and out. The haunch itself comprises an outer or canted beam, a diagonal beam following the line of the diagonal truss bracing, and a 12-foot-long top beam.

Lightweight trusses run at right angles to the main trusses and support roof beams and purlins. More than 1,000 tons of steel went into the structure. The brick front and rear walls of the arena conform to the slope of the trusses and the wings of the triangular haunches.

Plate assembly

The entire assembly of plates and shapes were flame-cut, beveled, fitted-up, and welded in the shop by iron powder-coated electrodes furnished by Lincoln Electric Co., Cleveland, Ohio. The contractor used A. W. S.

How a cost-beating, cy
can "unbind" yo

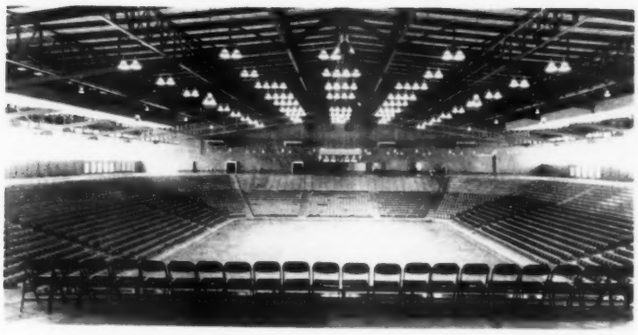
A TD-24 starts and gets "ready to run," seconds-fast. Morning, noon, or any other time you shut down the TD-24's diesel engine, you restart in seconds—and save yard-moving, wage-costing minutes! Exclusive International gasoline-conversion diesel starting does it—and the combustion-heated engine is ready to run as a diesel, without "gumming the works" with raw fuel!

TD-24 Cerametallic engine clutch eliminates time loss and upkeep cost of temperature-sensitive, "service-nervous" type clutches! You get the simplicity of long-familiar clutch design. You get the operating ease, temperature-immunity, and power-transfer efficiency of International Cerametallic facings. You get the instant readiness to operate perfectly when cold—plus heat-defiance for clutch-mauling jobs like 'round-the-clock shuttle-dozing.

TD-24 on-the-go shifting is a "double-barreled" cycle-speeder. The exclusive TD-24 two-speed planetary system gives instant, stall-preventing Hi-Lo shifting without declutching, in either the Torque-Converter or Gear-Drive models. And in the Gear-Drive model, you get two-direction "no-stop" shifting with exclusive synchromesh transmission.

TD-24 exclusive Planet Power steering eliminates load-limiting "dead-track drag"—gives full-time "live" profit power on both tracks. It's more than total engine hp or weight that

"The TD-24's 2-speed track steering holds you in 'dozing position with no slide-slip or power loss in turning," states Operator Jack Campbell for Owner J. H. Marshall, Clovis, New Mexico. The Marshall TD-24 is shown dozing tough caliche rock for road surfacing.



...e 14-ton triangular haunches carry the ...r ends of the trusses. Each wide-flange ...am is welded around a ¾-inch web ...e and the assembly is tied to the foun... by a 6½-inch round pin.

To provide adequate ceiling height inside the arena, the interior was excavated 19 feet 3 inches deep, thus depressing the arena floor and permitting banks of seats to be erected on concrete steps poured down from grade level.

Types E-6024, E-6027, E-6010, and E-6012. Some of the heavy sections required as many as 35 passes, and more than 25,000 pounds of electrodes were consumed in shop and field welding.

Flame beveling and shaping was carried out in the shops of the International Steel Co., Evansville. Fit-ups between truss chords and haunches were carefully laid out and gaged prior to field erection.

Half trusses were fabricated flat in the shop; diagonals and verticals—measuring back-to-back 5×5×⅞-inch angles that were skip welded—were attached to gusset plates in the top and bottom chords. Each half was shipped to the field in two sections. At the field, the sections were spliced at the center and laid in a flat position, then hoisted by a crane to be bolted temporarily to the haunch. The centers, supported by a high, movable platform, were joined together by a 5½-inch-diameter round pin to give a clear span inside. Upper and lower truss chords—the lower ones steadied by guy cables—were finally welded to the vertical beam of the haunch. THE END

HRB issues bibliography on resurfacing pavements

"Salvaging Old Pavements by Resurfacing", Bibliography 21, is now available for $1 from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. The annotated bibliography is divided into two parts—rigid-type overlays, and flexible-type overlays.

Each section contains an author and subject index. An index of portland-cement concrete resurfacing projects concludes the first part of the book; and a state index of bituminous resurfacing is in the second part of the book. The book covers articles published from 1932 to 1956.

Lightning destroys new highway pavement

During a summer storm, lightning destroyed 700 feet of newly laid concrete pavement on a construction job in Elk County, Pa. The lightning struck an exposed steel reinforcing bar, raced through connecting bars, and oxidized all bars under the section. The 9-inch-thick concrete pavement collapsed.

The damaged section of U. S. Route 219 contained about 2,000 tons of concrete and 15 tons of steel.

...g, cycle-speeding TD-24 ...g" your profit squeeze!

...ores and Perry, Laton, California, depend upon three ...ternational "75" Payscraper® units and a TD-24 Torque-Con...verter crawler—to fulfill their 8-mile grade-raising subcontract, on Central Valley Highway south of Hanford. TD-24 push helps boil-in 20 cu yd heap-loads, in only 42 seconds!

...ounts—watch how "dead-track drag" limits any ...ing-sized steering-clutch crawler to what it can ...handle on turns. Then watch how years-proved Planet Power steering gives the TD-24 full-time, both-track power—to pull or push extra-big loads on the turns or straight ahead, uphill or down!

...D-24 control ease puts record daily produc...tion at your operator's fingertips. Cool and safe flush-deck design, control-tower vision, and reach-easy fingertip controls all increase operator comfort and performance. Never before has big crawler work-power been so load-responsive—or record work-production so easy to achieve!

Prove positively your profit-margin widens—with geared-and-steered-for-action TD-24 power giving you the success-margin of push or pull! See your International Construction Equipment Distributor for a TD-24 demonstration!

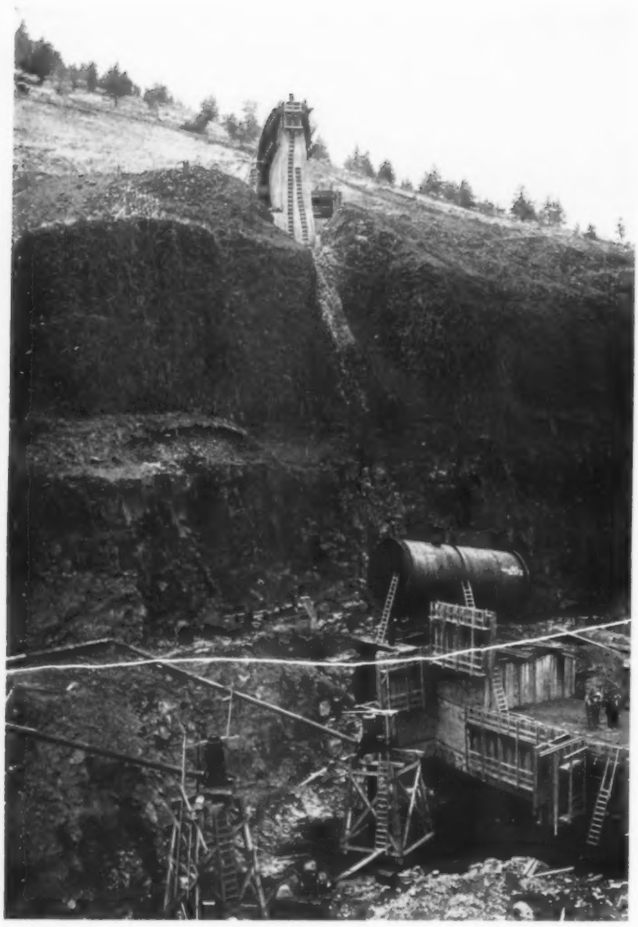
INTERNATIONAL® CONSTRUCTION EQUIPMENT

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

←For more facts, circle No. 285

Batching at a rate of 80 cubic yards per hour is done at this Noble plant which produces concrete for the main dam and other structures. The trainload of Gar-Bro 4-yard buckets, built up to 6-yard capacity, is moving out toward the cableway.



Forming and concrete placing start in the gorge as the first curving portion of the 204-foot-high dam rises on the left abutment. Heavy and varied forming is required for the variable-radius arch dam, which is 26½ feet thick at the base and 8 feet thick at the crest.

Forming, concrete work overcome job difficulties on variable-radius arch dam

Three types of form panels designed for sections of dam; cableway places concrete and handles materials in gorge

A Lidgerwood cableway places concrete in all portions of the dam. The head tower rides 600 feet of track, and the cableway operator is guided by two-way radio and telephone when concrete work is being done outside his range of vision.

Forming, batching, and concrete placing are critical operations on Pelton Dam, one of the few thin, variable-radius arch structures ever to be built in this country.

The concrete work has been made difficult by the size and shape of the dam itself, which is now nearing completion on the Deschutes River in Oregon as part of a hydroelectric project for the Portland General Electric Co.

Rising to a height of 204 feet, 1,585 feet above sea level, the dam is only 8 feet thick at its crest. The base, with a 350-foot radius, is 26½ feet thick. It rests on a volcanic tuff bedrock, a formation known as John Day, which is overlaid with a 160-foot-thick layer of basalt. Both dam abutments curve into keys blasted into this material. The dam foundation, as well as the side walls, are being pressure-grouted to seal off natural fissures in rock and to take care of void inequalities that may develop under settlement.

This design was by Ebasco Services, Inc., New York, and the contract for the 40,000-cubic-yard arch dam, for a rock-fill re-regulating dam below the main structure, and for ex-

tensive fish-passing facilities, is held by Guy F. Atkinson, Portland and South San Francisco.

About 25 per cent of the cost of the project is represented by a 3-mile fish ladder, a fish tunnel through the spillway ogee crest of the re-regulating reservoir, and extensive handling work—which included transporting salmon by truck—during the early stages of construction.

Directly downstream is a 3-unit, outdoor-type powerhouse, which will have a 40,000-kw hydroelectric generating set in each bay. Each generator will be supplied by a 16-foot penstock. These are being located near the bottom of the dam so that salmon fingerlings will not be drawn into them, and also for reasons of economy.

Use cableway system

Since the high, narrow gorge dictated the use of a cableway for placing concrete, Atkinson took the cableway used at McNary Dam on the Columbia out of storage, redesigned and strengthened it, and set it up so that all parts of Pelson Dam could be reached by the system. The head tower is on a set of tracks allowing 600 feet of travel, and the tail tower is on a firm anchorage on the opposite side of the gorge. Both are some 400 feet above the elevation of the dam crest.

The 3¼-inch main cable spans 2,000 feet between the tail anchorage and the head tower. Inside the head tower is a powerful Lidgerwood hoist capable of handling the heaviest lifts required for this job. The cableway system is controlled by an operator having a panel board within sight of about two-thirds of the concrete-placing area. A telephone and two-way radio system are used to direct the operator when work is being done on the remaining portion of the dam.

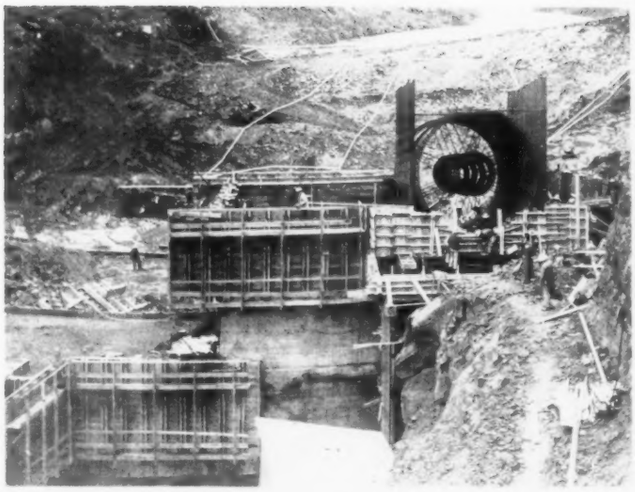
Whenever concrete-placing operations are not under way, the cableway is used to handle concrete forms; hoists; various materials, including reinforcing steel; and to place penstock sections. All this is being done by the cableway because there is little room for conventional crane equipment to operate in the bottom of the gorge.

Forming

Curving faces and other hard-to-fit sections of this variable-radius dam made form design and construction one of the most difficult parts of the job. And it was made even more difficult when federal officials held up all concrete work on the dam until arrangements for handling salmon below the dam had been worked out.

Winter had almost arrived before concrete work could start, and then it was desirable for 10 rather than 5-foot lifts to be made. Because of this, very heavy forms, some of them weighing up to 8 tons, were designed in the specialized section of Atkinson's main office in South San Francisco.

(*Continued on next page*)



Three types of panels, of heavy steel backing faced with 2×6 tongue-and-groove sheeting, are being used as forming for the 10-foot lifts. Panels 57 to 65 feet long are used for upstream and downstream faces; similar panels are used for curving sections; a third type is used to form square faces.

Firestone Rock Grips lead all tire choices for heavy equipment on all job conditions!

Firestone Tubeless Rock Grips save time two ways! Off-highway users make them their first choice of tires for beating downtime losses. They're top choice, too, when it comes to rolling heavy equipment over all types of terrain. Two great treads eliminate your need for changing tires to match the job. You get the *full flotation* you need for sand and soft stuff. And the same tread gives you the *armored grip* you want for hauls over rock or rubble. Safety-Tensioned *Gum-Dipped*® NYLON bodies, combined with specially compounded treads, defy cuts and slugging impacts. Ask your Firestone Sales Engineer about these heavy construction favorites. Contact him today—through your local Firestone Dealer or Store.

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(Continued from preceding page)

Equipment is kept in top-notch condition at all times at the headquarters shop on the job. The Gardner-Denver 600-cfm rotary compressor is being serviced by a Lincoln mobile service truck.

The three principal types of forms in use have been patterned after the steel-backed, wood-faced, cantilever-type forms used by Atkinson on Pine Flat Dam in California.

Type A panels, used on the upstream and downstream faces of the main arch dam, consist of heavy steel backing faced with 2×6 tongue-and-groove kiln-dried sheeting. These panels are from 57 to 65 feet long.

Type B panels are similar, and are made up for use where Type A panels will not fit on the curving faces. Some of these were used where the dam juts out from bedrock, a place where cantilevered arms cannot be positioned.

Type C panels are more conventional sections for use on bulkheads and areas where square faces are desired.

In general, 10-foot-lift blocks of these panels are being placed for lengths of 53 feet at the center line of the structure.

All the forms were made up in a central carpenter yard equipped with such power tools as DeWalt saws and a large Oliver bandsaw, and a number of portable tools, including Skil-Saws.

In addition to working on the A, B, and C panels, carpenter crews handle a considerable amount of layout work for the wood-faced draft tubes, cut circular arch ribs for the draft tubes, and fit hemlock facing to mold the draft-type concrete into shape.

All concrete forms are being held in place by Williams form rods. Many of the forms are arranged in the usual cantilevered manner so that the only form hardware lost after each pour are Williams tie-down hairpins. As forms are stripped, they are raised into place for the next lift by the cableway.

Central concrete plant

Concrete for the dam, the re-regulating dam, and other nearby structures is being turned out by a Noble full-automatic batcher. This has an aggregate storage capacity of 350 tons. On a berm just above the plant is a 500-barrel-capacity bulk cement storage silo. On a platform directly beneath the batcher are two Smith mixers of 2-yard capacity that help keep the job moving at an average production rate of 80 cubic yards per hour. During the winter, a hot-water heater was installed in the batch plant to keep concrete at a temperature above the minimum 45 degrees F required by the specifications. Protex air-entraining agent is being used to increase the workability of the mix and to reduce segregation in the concrete.

Several mixes are being turned out by the plant for different parts of the dam. A Class A mix, designed to yield 4,000 psi at 91 days, is being used for the main arch dam. Early in the job, experiments were made with 5 and 5½ sacks of concrete per cubic yard of mix, which yielded 7,000 psi. This was later reduced to 4.5 sacks per cubic yard, which was enough to develop the required strength of 4,000 psi.

Five sizes of aggregates are being used in the mixes—6-inch-minus cobbles, 3-inch-minus aggregate, 1½-inch-minus and ¾-inch-minus aggregate, and sand. The sand is a blended product of two sizes, and it is designed to have a near-perfect fineness modulus.

The Class B concrete is a 3,000-pound mix which is being used in the regulating dam and spillway sections. Class C and D concrete, designed to develop 2,500 pounds at 28 days, are being used for minor work where strength is not of great importance.

ENDS MESS AND WASTE

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EASIER, FASTER, CLEANER LUBRICATION FOR CONTRACTORS

There's no mess, no spilling, no waste in filling your grease guns—when you use the new Sinclair LITHOLINE Multi-Purpose Grease Cartridge. Takes only seconds to pop a cartridge into the gun—and you're ready to lubricate. Fits all regular cartridge type guns.

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A Sinclair Lubrication Engineer will be glad to show you how the new Sinclair LITHOLINE Multi-Purpose Grease Cartridge can help *you*. Call your nearest Sinclair Representative, or write Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N. Y. *There's no obligation.*

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MULTI-PURPOSE GREASE CARTRIDGE

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Concrete for the main arch dam is dumped from the Smith mixers into Gar-Bro air-controlled buckets, mounted two to a rail car. These are pushed to the cableway by a small General Electric diesel-powered locomotive.

Five 4-yard Dumpcrete bodies on Ford F8 trucks are being used to bring concrete from the plant to the re-regulating dam and other structures.

When concrete placing began, production was a little disappointing because of the length of time it took for the cableway to transport a loaded circular-type 4-yard bucket to a pour. But when the buckets were built up from 4 to 6-yard capacity, production jumped from 45 to 65 cubic yards per hour.

As the cableway operator carefully spots a bucket and the dump is made, crews consolidate the concrete. A combination of water curing and Hunt Process Clear is being used for curing: Hunt Process Clear is being used only on exposed faces; water is used on the remainder of the concrete. Once a lift has been completed, the surface of what is to become a horizontal construction joint is cleaned by a blast of air and water before the next pour is started.

During the early stages of construction, the river's flow of more than 5,000 cfs was sent through a diversion tunnel. When the dam is finished, this will be sealed off and plugged permanently.

Personnel

Field work on the contract for Guy F. Atkinson Co. is under the general supervision of Vernon R. Bradley, project manager; P. K. Mitchell, assistant project manager; and J. Bud Goodier, project engineer.

Ebasco Services' officials include F. C. Schlemmer, general manager; D. L. Haughton, general concrete engineer; John B. Dotterer, construction superintendent; W. J. Swanson, construction engineer; J. G. Fisher, office engineer; R. N. Verlander, field engineer; and William Hjelm, concrete engineer. Serving as resident engineer for Portland General Electric Co. is L. J. Kelsh. THE END

Heavy and intricate forming is built up in the contractor's carpenter yard at the site. Under construction here is a penstock draft tube. Stacked lumber, used for the three types of panel sections required by the dam, are handled by a Bay City truck crane.

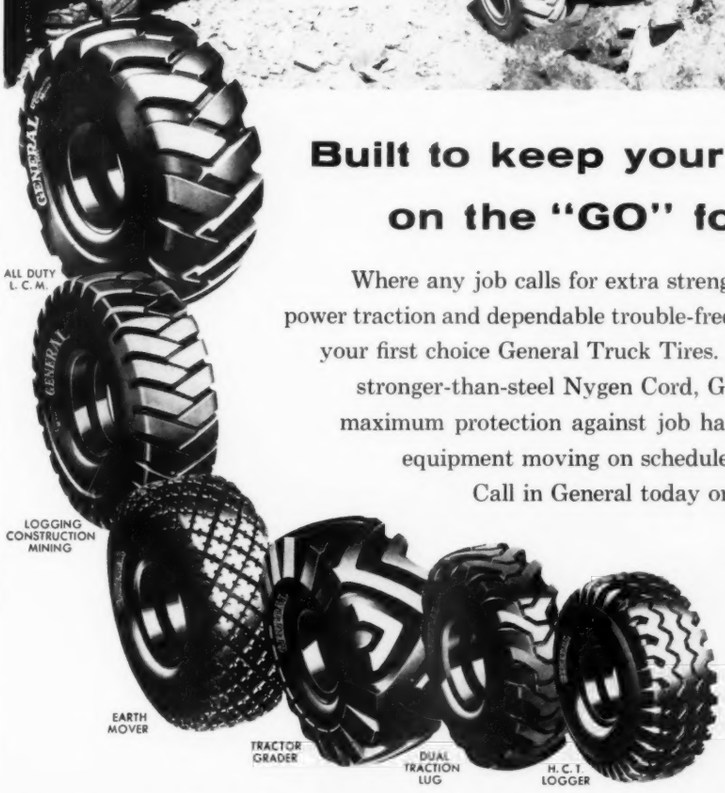
Specialized Trailers changes firm name

Ziegler Trailer & Equipment, Inc., 7400 Laurel Canyon Blvd., North Hollywood, Calif., is the new name of Specialized Trailers, Inc. Ziegler Trailer manufactures custom heavy-duty mobile equipment.

At the same time, the firm has been appointed the Southern California distributor for the Worthington Corp., Harrison, N. J. Ziegler will handle Worthington's line of concrete truck mixers and big mixers. Some sub-assembly and manufacturing operations are planned, in addition to installation and service.

Ziegler Trailer has also been named California distributor for Dorsey Trailers, Inc., Elba, Ala.

GENERAL NYGEN® TIRES



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Where any job calls for extra strength and stamina, for power traction and dependable trouble-free performance, make your first choice General Truck Tires. Built with exclusive stronger-than-steel Nygen Cord, General Tires provide maximum protection against job hazards . . . keep your equipment moving on schedule for positive profits. Call in General today on your toughest job!

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THE GENERAL TRUCK TIRE

THE GENERAL TIRE & RUBBER CO. • Akron, Ohio

For more facts, use Request Card at page 18 and circle No. 288

Two streets in one are provided by the job, which links Boston's northeast and southeast expressway systems. The approach roadway has a slab 4 to 13 feet thick to overcome the hydrostatic pressure of the ground. The tunnel roof will be paved for local traffic.

Maze of problems overcom bu

Traffic and underground utilities being maintained during job; massive roadway slabs overcome hydrostatic ground pressure

What is claimed to be the world's widest underground tunnel is taking shape in Boston, Mass., as part of the $80 million John F. Fitzgerald Expressway. Under a $13,403,490 contract, the V. Barletta Co., Roslindale, Mass., has until next May to complete the 2,380-foot-long tunnel, together with its 90 and 500-foot-long approaches, which will link the northeast and southeast expressway systems running through Boston.

Open-cut approaches

The project begins with a 500-foot-long open-cut approach near Congress Street and runs along just west of and almost parallel to Atlantic Avenue. The roadway slab between the two concrete retaining walls was designed to have a thickness varying from 4 to 13 feet to overcome the hydrostatic pressure of the ground and to replace the weight of the soil removed. This weight-replacement feature was incorporated into the design of the open approaches and tunnel so that the static ground foundation conditions found under the tunnel and approaches could be maintained.

Excavation for the approaches got under way as a Lorain 2-yard shovel made an open cut to carry the excavation down about 15 feet below the existing street surface. The cut was then continued with a backhoe until a level was reached 5 to 6 feet above the designed grade. A Lorain crane with a 2-yard clamshell bucket on a 75-foot boom then excavated to the designed subgrade elevation. All material was loaded into a fleet of White 12-yard dump trucks, which hauled the waste to a school construction site for use as backfill.

The 1-foot blanket of gravel spread on the 5.6 per cent grade of the approach by a Caterpillar D8 tractor-dozer was topped with a 6-inch-thick concrete slab. Concrete, delivered to the various pours by ready-mix trucks, was either chuted directly to the pours or placed with the crane-and-bucket method.

The 6-inch slab was covered with 1-ply membrane waterproofing, then topped with a layer of brick in mastic, before the 4 to 13-foot reinforced-concrete approach roadway slab was placed. The waterproofing membrane was extended beyond the sides of the slab to overlap the waterproofing in the concrete retaining walls. This assures that the slab and the 8 to 35-foot-high concrete retaining walls will be watertight. All formwork was

Builds seven-billion-gallon reservoir s no

H. D. Tousley Co., builder of Morse Reservoir, uses one source for petroleum products—STANDARD OIL

Two miles northwest of Noblesville, Indiana, H. D. Tousley Co. built Mor Reservoir for the Indianapolis Water Company, one of the largest privat owned water utilities in the country. The reservoir impounds Cicero Cre to create a seven-billion-gallon reserve water supply for the city of Indi apolis. It was a $6.5 million job. The contractor did it with one supplier petroleum products – Standard Oil. This is one of the reasons Tousley u Standard Oil products:

Standard Oil works direct with Tousley. On this job Standard Oil Co pany worked direct with the contractor. A Standard Oil bulk station onl few miles from the job made deliveries whenever needed, day or night. O of Standard Oil's 23 Division Offices located in Indianapolis gave he Tousley maintenance men thus had no worries about service on diesel fu gasoline, motor oil, grease.

Lubrication technical service. Out of the Standard Oil Division Office, on 23 miles from the job, the Tousley Co. had the services of experienced lub cation specialists. On this project, Standard's chief automotive engin and a lube specialist worked with job and equipment superintendents. Th made a lubrication survey, recommended STANOLUBE HD-M Motor Oil a AMOCO* Lithium Multi-Purpose Grease for all equipment. They cut dow the number of products Tousley needed to inventory, eliminated chanc of application errors and saved the contractor money. The Tousley Co. h an impressive inventory of equipment – 62 trucks and cars; 18 bulldoze high-lifts and motor graders; 3 scrapers; 12 cranes and 12 air compresso They stay in top condition because of the top maintenance given by th H. D. Tousley Co. and top lubrication technical service received fro Standard Oil lube specialists.

Get this kind of service from Standard Oil anywhere in the 15 Midwest an Rocky Mountain states. Call your nearby Standard Oil office. Or wri Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illino

F. E. Hull, Standard Oil chief automotive engineer (left), and M. B. Shookman, Standa automotive lubrication specialist (right), go over lubrication of Caterpillar drive w Tousley Co. maintenance superintendent, Jim Smith. Experienced Standard Oil men as these give lubrication technical service to contractors. Forrest Hull has been dri this work for 13 years; Miles Shookman, for five years. Both men have completed Standard Oil Sales Engineering School.

build new urban tunnel

Timber bracing, lower right, supports the sheeting driven to support the existing street that parallels the tunnel. Altogether, 17,500 tons of structural steel supplied by Bethlehem Steel Co. are going into the framework of the tunnel.

fabricated on the job during this phase of construction.

Tunnel excavation

The backhoe began the tunnel excavation by removing about 15 to 20 feet of overburden along the center line of the tunnel, forming a swath about 100 feet wide that reached to within 20 feet of each side of the tunnel. The final grade was reached by the Lorain crane with the clamshell bucket.

After the 1-foot-thick gravel blanket had been spread on the final grade and topped with a 6-inch-thick concrete mat, the 1-ply waterproofing membrane was placed. This was covered with a layer of brick in mastic, which was topped with a 2-inch-thick protective cement finish.

The transverse 36 WF floor beams, averaging 90 feet in length, were placed on top of the 2-inch finish on 5-foot centers by a P&H truck crane. The lengths of the floor beams varied, according to the width of the tunnel.

With the Bethlehem Steel floor beams in place, Barletta proceeded to cover them with Class A invert concrete. The top of the invert concrete, which reached a point 6 inches below the finished roadway surface, was rough-screeded by hand to conform to the shape of the roadway surface, forming the superelevated and crowned sections of the tunnel roadway.

Interlocking ZP 38 sheeting was then driven about three feet away from the tunnel wall line and to about ten feet below design grade by a Vulcan steam hammer mounted on a Marion crane equipped with 50-foot leads. This 35-foot-long sheeting was braced with 14×14-inch timbers, placed against the completed invert slab, while the remaining width of the tunnel was excavated.

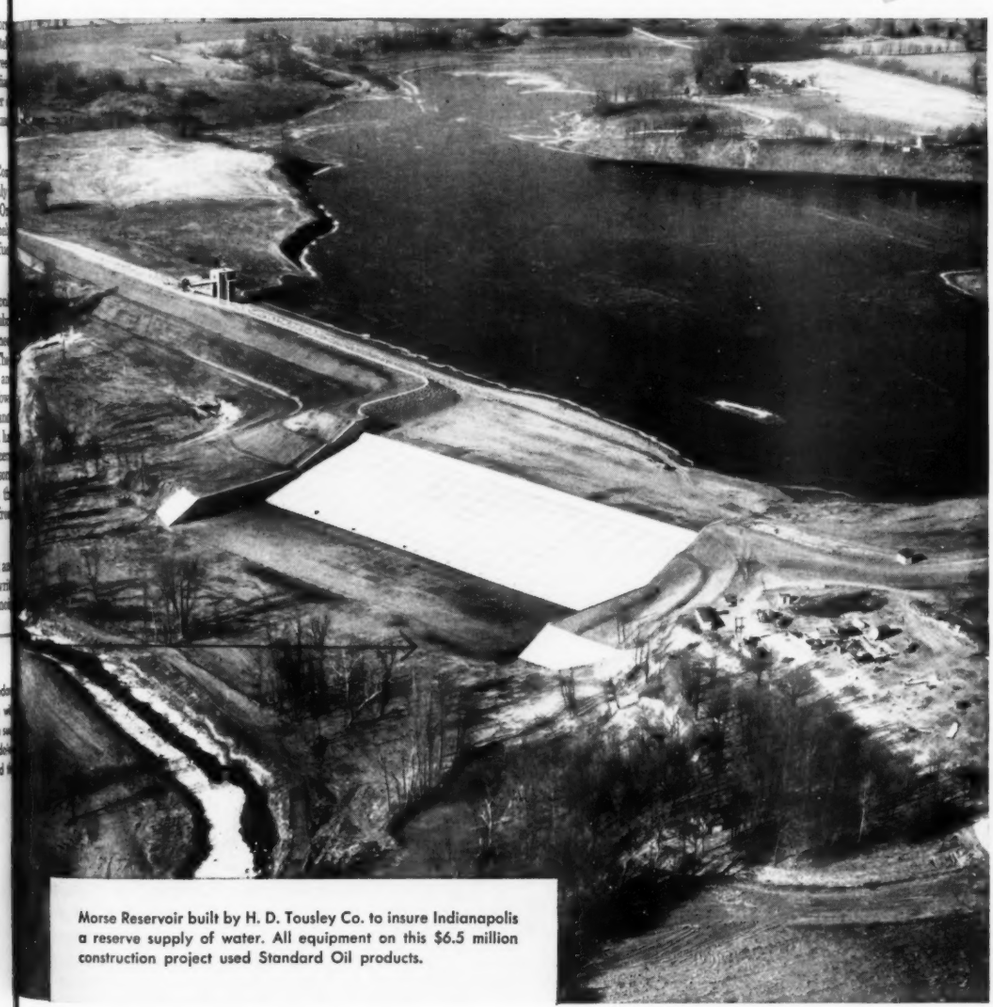
This done, and the gravel blanket, concrete mat, brick layer, membrane waterproofing, and 2-inch protective finish placed, 20-foot-long 36 WF sections were bolted to the ends of encased floor beams to complete the width of the floor. These splice sections, handled the same as their 90-foot-long counterparts, were also encased in an adjacent invert slab pour. The splices were made at points where existing utilities outside of the excavation required the sheeting for their support.

Streets relocated

Where the tunnel intersects existing streets, the contractor has driven

←For more facts, circle No. 289

nobody goes thirsty in Indianapolis



Morse Reservoir built by H. D. Tousley Co. to insure Indianapolis a reserve supply of water. All equipment on this $6.5 million construction project used Standard Oil products.

Quick facts about Standard Oil products for construction equipment

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(Indiana)

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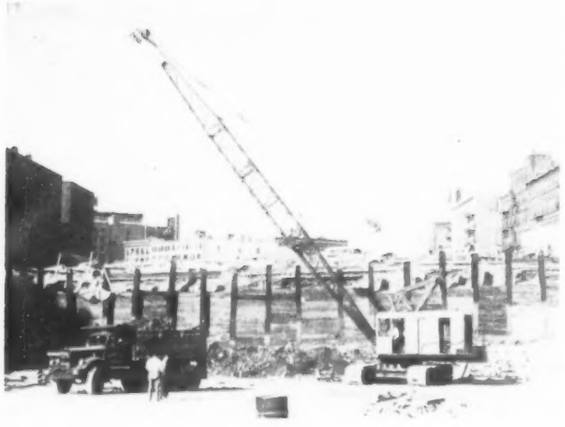

The Lorain uses a 2-yard clamshell on a 75-foot boom to load a White 12-yard dump truck. The H-beam piling and sheeting support the embankment of an intersecting street, which will be routed over the tunnel before the existing street is excavated.

(Continued from preceding page)

14-inch, 73-pound soldier beams 10 feet below grade to support the street embankment. This is being done at all street crossings so that existing utilities, now carried under the streets, may be relocated under the tunnel floor by the Boston Edison Co.

When a section of tunnel roof is completed next to an intersecting street, traffic is routed over the completed roof of the tunnel. Then, after all utilities under the existing street have been relocated under the tunnel, the contractor is able to excavate and remove the intersecting street and carry the tunnel forward to the next intersection.

Supporting the 36 WF roof beams are three rows of columns on 5-foot centers; two rows of outside wall columns are made of 21 WF sections, and a center-line row is of 12 WF sections. The exterior columns will be encased in Class D concrete after being wrapped with 4×4-inch, No. 12 wire mesh, and they will have a 1-inch minimum cover. Connecting the exterior columns are ¾-inch-diameter tie rods, spaced on 2-foot centers measured along the columns.

The reinforced-concrete cover will be faced with 4-ply membrane waterproofing and a 4-inch concrete-block protective course along the outside surface of the wall. The inside faces of the exterior walls and both sides of the center dividing wall will have a ceramic tile covering.

A Manitowoc 3500 crane is handling the erection of the roof beams, which are being fastened to the columns with Bethlehem high-tensile bolts. Chicago Pneumatic impact wrenches, powered by Ingersoll-Rand air compressors, are used to make connections.

The top flange of the roof beams will be encased in a 9-inch-thick reinforced-concrete slab, which will be covered with a 4-ply waterproofing membrane. The membrane will then be topped with a 2-inch protective course of asphaltic concrete before gravel fill is placed to bring the upper, local-street roadway to grade. A 4½-inch blanket of crushed stone, laid over the gravel, will be topped with a 2½-inch asphaltic-concrete wearing surface for local Boston traffic. This upper-level street will consist of two 34-foot roadways separated by a concrete divider.

Though all electrical utility lines are being relocated under the tunnel, existing steam lines are being routed over and supported by the tunnel roof. The steam lines are given temporary support by Bailey bridges spanning the tunnel excavation, before they are lowered onto the completed tunnel roof.

Entrances and exits

Access to or from the tunnel will be provided by earth-filled ramps to the upper roadway which, in turn, affords access to the local streets. Ramps will be 20 or 24 feet wide and constructed of reinforced-concrete slabs varying in thickness from 2 to 8 feet. This thickness, again, is to offset the hydrostatic pressure and replace the weight of the overburden removed during excavation. There will be two main roadways 40 feet wide on either side of the center wall, but the acceleration and deceleration lanes make the tunnel wider at entrance and exit locations. The longest roof beam to be erected on this project, measuring about 140 feet long,

AUSTIN-WESTERN **HYDRAULIC CRANE**

HUNKIN-CONKEY REPORTS: A-W proves versatility, speed and economy on tough contracting jobs

Early in 1956, The Hunkin-Conkey Construction Co., a major contractor with home offices in Cleveland, undertook a reconstruction job at one of that city's large steel plants. Time studies showed that 95% of the lifts were within the 5-ton range, so a diesel-driven Austin-Western unit was purchased. It was equipped with an 18-ft. extensible boom and 6-ft. manual extension, plus 4-wheel drive, 4-wheel power steer and hydraulic outriggers.

The Company says: "During the first year of use, this crane operated on an average of 2 shifts a day with complete success. Because the construction contractor meets so many different operating conditions, versatility in a machine is most desirable. We found this quality built into our Austin-Western."

Does many jobs well. "With it we install such equipment as conveyors, motors and pumps . . . We use it with a hitch to haul trailers with up to 5 tons of reinforcing steel, and sometimes have hauled as many as 5 trailers in a string . . . In restricted areas we use it to pour concrete brought up from our redi-mix plant in trucks. Maintenance men use it for changing tires or wheels in the yard or out on a job, and to remove engines for maintenance or repair . . . It is a handy emergency unit to have in the equipment storage yard when not out on a job."

Safer to operate. "We find the A-W safer to operate, particularly in congested areas, because it permits less swing of the load. Its boom responds instantly to the operator's touch. The boom also hydraulically extends and retracts while rotating and raising or lowering."

Costs less than half one man's wage. "Our cost record shows a total machine cost, exclusive of overhead, of only $12.11 a day, less than half the operator's wages. The cost, with the operator's wage included, is just over $5 an hour."

For the complete Hunkin-Conkey story, ask for Gould Certified Report No. 5703.

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Retaining walls line the 500-foot-long open-cut approach near Congress Street. In the background, a Lorain crane carries excavation forward near an intersecting street.

was placed to span not only the two 40-foot roadways but an entrance and an exit ramp. The tunnel, which will have a minimum vertical clearance of 14 feet 3 inches, will be illuminated by fluorescent fixtures running along both edges of each ceiling.

Personnel

Frank Venti is the superintendent, and Leo Picardi the assistant superintendent, for Barletta. George E. Lybrand is the resident engineer on the tunnel project for the Massachusetts Department of Public Works which has Carl Sheridan as Commissioner. Edgar W. Kumpel, the district engineer for the Department, is supervising the entire $80 million central artery project.

THE END

Timber Engineering offers college outline in timber design and construction

A college outline for architect and engineering professors and students on the subject of timber design and construction has been prepared by the Timber Engineering Co., 1319 18th St. N. W., Washington 6, D. C. The outline is designed to serve as a guide for a separate course or as a supplement for other courses in timber design.

The outline closely follows the "Timber Design and Construction Handbook" prepared by Timber Engineering and published by F. W. Dodge Corp., 119 W. 40th St., New York 16, N. Y. This book is suggested as a supplementary text. The college outline deals with such subjects as physical, chemical, and structural properties of wood; design considerations; post and beam construction; types of roof trusses and fastening devices; and exterior structural design and construction methods.

Copies of the outline may be obtained free of charge from Timber Engineering Co.

Concut Sales opens office

Concut Sales, Inc., El Monte, Calif., has opened a new office in Sacramento, Calif. The office will serve the San Francisco area, northern California, and Nevada, and will carry the complete line of Concut sawing machines and concrete and masonry sawing blades.

David J. Loudon will be in charge.

"Why didn't you take his hat? Now he'll be able to read the fine print!"

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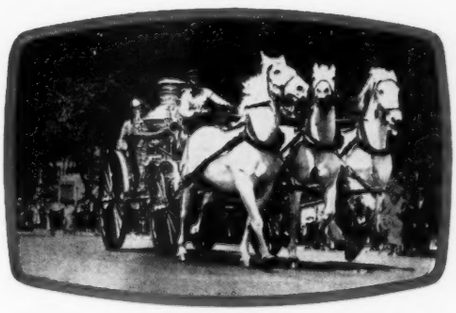
"Eleven Against the Ice", the story of the Antarctica Turnpike. See men and machines build a trail across Antarctica's frozen wastes—in spite of 200 mph winds, temperatures of 120 degrees below zero and crevasses big enough to swallow a 20-story building. It's a triumph of engineering and human courage, a whale of a television show.



Over 142 NBC STATIONS, NOVEMBER 21st

"The Innocent Years". Recaptured from exciting old films and newsreels, you'll see happy days relived. Experience the excitement of "Teddy" Roosevelt, Thomas Edison and Mark Twain in action. Hear songs like: "In the Good Old Summertime", "He'd Have to Get Out and Get Under". Enjoy the fun of family picnics, the joys of people in the last untroubled time in our history.

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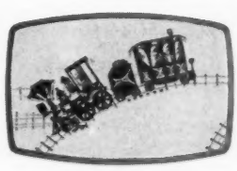
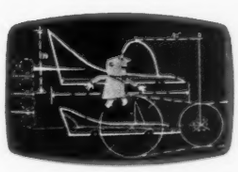
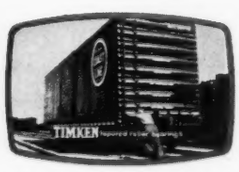
See How man stumbled on the concept of the wheel.



See Why America's railroads have always led the world.



See Why Americans jump for the latest thing in cars.



See One man push a freight car all by himself.

Years of national and trade advertising, backed by their superior performance, have made "Timken" the best-known name in bearings—a name that helps to sell the products that use Timken® bearings. Now, network television will build even a greater awareness of Timken bearings—make them an even bigger sales plus in the equipment you sell. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

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Maintaining delivery schedules is of paramount importance in busy, one-way Gravier Street in New Orleans—the only street with access to the job. As traffic whizzes by, a Smith mixer on a Mack truck chutes Haydite concrete to the 1-yard hopper of the Archer tower.

Contractor makes most of crews in limited space on new building

Four trades work simultaneously on same floor of 18-story structure; form setters, steel workers, electricians, concrete crew keep pace fast

Restricted working conditions and limited storage space are making construction of the Commerce Building in downtown New Orleans resemble the job of building a model ship in a bottle.

As with a bottle, the site has only one entrance that can be used to get materials to the crews. This is on congested Gravier Street, which the building faces. On the north and west, the 18-story building is crowded by tall structures; on the east is a narrow alley. Only by carefully planning the flow of materials to the building is the contractor able to keep the job moving according to schedule.

Under a general contract in excess of $5 million, R. P. Farnsworth & Co., Inc., New Orleans, is building the structure for Gravier Improvement Co. Because of the foundation problem in New Orleans, buildings of this height are usually of steel. But a shortage of steel prompted the architectural firm of Nolan, Norman & Nolan, New Orleans, to design the building for reinforced, lightweight concrete.

The first five floors contain parking space for 250 automobiles; the upper floors will be used for offices. These upper floors, which will have special air-conditioning equipment to allow independent regulation of temperature within individual offices, will have an exterior of window walls on the south and east. The two sides that are close to adjoining buildings will be of manganese velour brick backed by tile brick. The parking floors will be left open to the air, but aluminum louvers will be installed in certain places to protect the residents of adjoining buildings from exhaust fumes. The parking floors are on split levels and access is gained by means of ramps. In addition to the parking

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While electricians install a Walkerduct system for electric and telephone lines in one quarter section of the floor, carpenters set forming, steel workers set reinforcing, and concrete crews pour concrete in different quarter sections.

Much of the pipe work is prefabricated on the second floor of the building. This plumber is using a Power Mule, manufactured by the Toledo Co., as a power takeoff to thread a section of pipe.

space on the first floor, the building will house a drive-in bank.

Both the design and construction of the building were complicated by the odd shape of the lot the building occupies. Its front dimensions of 127.3 feet close in to 111.6 in the back. The west side of the lot is 134.2 feet in length, the east side, 130.8 feet.

Keep supplies moving

In spite of the congested and limited working area, the contractor is keeping the various parts of the job moving along at an orderly pace. Nowhere was this more evident than in the job on the upper floors.

The steel storage yard was changed several times during the course of construction, and its final location was almost a mile from the job. This yard holds about a two-week supply of material. Ford trucks with pole trailers hauled the steel through heavy traffic to the street in front of the building. The reinforcing was hoisted to the proper floor by a Chicago boom mounted on a twin tower of the lift. The 1,300 tons of reinforcing steel was supplied by two firms: Orleans Materials & Equipment Co., Inc., New Orleans, supplied the big 2¼-inch bars used in the columns, and Laclede Steel Co., Inc., St. Louis, Mo., furnished the remainder of the steel.

Concrete for the job was supplied by Jahncke Service, Inc., New Orleans, in Smith mixers mounted on Mack trucks. This lightweight concrete contained an expanded clay aggregate, Haydite, and it weighed only 105 pounds per cubic foot as compared with 150 pounds per cubic foot for regular concrete. The six-sack mix also contained 0.2 pound of Pozzolith per sack. Specifications called

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POUGHKEEPSIE—B. F. Goodrich Store GLobe 2-9030
SCHENECTADY—B. F. Goodrich Store DIckens 6-4282
SYRACUSE—B. F. Goodrich Store 74-5351
UTICA—B. F. Goodrich Store 3-7536

NORTH CAROLINA
ASHEVILLE—B. F. Goodrich Store 3-2726
CHARLOTTE—B. F. Goodrich Store EDison 3-4134
DURHAM—Nu-Tread Tire Co. 9-2087
FAYETTEVILLE—B. F. Goodrich Store 2-2458
GREENSBORO—B. F. Goodrich Store 2-3197
RALEIGH—B. F. Goodrich Store 3-3831

OHIO
CINCINNATI—B. F. Goodrich Store CHerry 1-4050
CLEVELAND—B. F. Goodrich Store PRospect 1-2650
ELYRIA—B. F. Goodrich Store 2552 or 2955
HAMILTON—B. F. Goodrich Store TWinbrook 3-4711
MANSFIELD—B. F. Goodrich Store 4500-6
MARIETTA—B. F. Goodrich Store FRontier 3-2096
TOLEDO—B. F. Goodrich Store CHerry 3-1258
WOOSTER—Strock's Tire Company HOward 2-6906

OKLAHOMA
MIAMI—Miami Sales Company KImball 2-2888
OKLAHOMA CITY—B.F.Goodrich Store FOrrest 5-1347
TULSA—B. F. Goodrich Store LUther 5-1221
TULSA—Tom P. McDermott, Inc. DIamond 3-9188

OREGON
EUGENE—B. F. Goodrich Store DIamond 5-6141
PORTLAND—Mel Goodin Tire Co. BEImont 5-4127
PORTLAND—B. F. Goodrich Store BEImont 6-2106
SALEM—Russell's Tire Service EMpire 2-5651

PENNSYLVANIA
CLEARFIELD—J. B. Beard 5-9644
ERIE—B. F. Goodrich Store 2-3205
HARRISBURG—B. F. Goodrich Store CEdar 4-6296
HOMETOWN—Schultz TAmaqua 2300
JOHNSTOWN—McNally Tire & Rubber Co. 5-4321
LANCASTER—B. F. Goodrich Store EXpress 2-2196
PITTSBURGH—B. F. Goodrich Store MUseum 2-8310
READING—B. F. Goodrich Store 4-2274
SCRANTON—Kelly Smertz DIamond 3-3925
TURTLE CREEK—B. F. Goodrich Store VA 3-2110
WILKES-BARRE—Economy Gas & Oil VAlley 3-0169
YORK—L. J. Allen 5728

RHODE ISLAND
PROVIDENCE—B. F. Goodrich Store DExter 1-9800

SOUTH CAROLINA
CHARLESTON—B. F. Goodrich Store 2-8391
COLUMBIA—B. F. Goodrich Store 4-8135
FLORENCE—B. F. Goodrich Store 4319
GREENVILLE—Tires, Inc. 5-9657
SPARTANBURG—B. F. Goodrich Store 5491

SOUTH DAKOTA
SIOUX FALLS—B. F. Goodrich Store 4-9979

TENNESSEE
BRISTOL—B. F. Goodrich Store 4650
CHATTANOOGA—B.F.Goodrich Store AMherst 7-1176
CLEVELAND—B. F. Goodrich Store GReenwood 6-4573
DYERSBURG—B. F. Goodrich Store ATwater 5-4820
JACKSON—B. F. Goodrich Store 7-8541
KNOXVILLE—Tinsley Tire Co. 5-0286
MEMPHIS—B. F. Goodrich Store JAckson 5-8477
MEMPHIS—Swayne Latham Tires, Inc. BRoadway 5-8121
MORRISTOWN—B. F. Goodrich Store 55
NASHVILLE—B. F. Goodrich Store ALpine 5-6353

TEXAS
BRYAN—Brazos Tire Service TAylor 3-3078
CORPUS CHRISTI—B. F. Goodrich Store TUlip 4-8841
DALLAS—B. F. Goodrich Store RIverside 1-1201
EL PASO—B. F. Goodrich Store 3-2478
FORT WORTH—B. F. Goodrich Store EDison 2-9188
HARLINGEN—B. F. Goodrich Store GArfield 3-0330
HOUSTON—B. F. Goodrich Store CApitol 7-0141
MARSHALL—Manly's 5-6776
ODESSA—Odessa Tire & Supply, Inc. FEderal 7-8378
SAN ANTONIO—B. F. Goodrich Store CApitol 7-7278

UTAH
PROVO—B. F. Goodrich Store FRanklin 3-6715
SALT LAKE CITY—Frank Ford's Transport Tire Service HUnter 5-5711
SALT LAKE CITY—B. F. Goodrich Store EMpire 4-7858
VERNAL—Superior Tire Service 445

VERMONT
BURLINGTON—B. F. Goodrich Store 2-3901

VIRGINIA
WINCHESTER—B. F. Goodrich Store MOhawk 2-0381

WASHINGTON
ABERDEEN—B. F. Goodrich Store 276
MOSES LAKE—O. K. Rubber Welders ROckwell 5-3303
SEATTLE—B. F. Goodrich Store ELliott 6666
SPOKANE—B. F. Goodrich Store MAin 5271
TACOMA—B. F. Goodrich Store MAin 9173

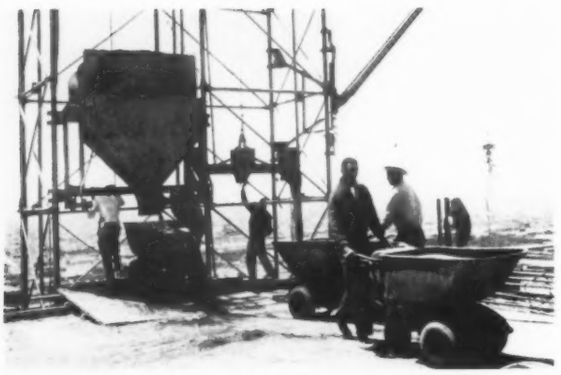
WEST VIRGINIA
CLARKSBURG—B. F. Goodrich Store MAin 4-7681
HUNTINGTON—Stettler Tire Co. 3-0197

WISCONSIN
LA CROSSE—B. F. Goodrich Store 4-4336

B.F.Goodrich
FIRST IN RUBBER

For more facts, use Request Card at page 18 and circle No. 292

(*Continued from preceding page*)



Concrete delivered to this stationary hopper on the Archer twin tower is dumped into 9-foot-capacity, gasoline-powered Prime Movers that are wheeled to the pours. The floors of the building are being poured in quarter sections so that four crews can work at one time.

for a 3,750-pound break at 28 days.

The ready-mix trucks rolled in alongside the curb and chuted the concrete to a 1-yard moving hopper in the Archer twin tower. An American three-drum hoist lifted the hopper to the desired floor, and it automatically dumped into a fixed hopper mounted on the frame of the tower.

Forming, pouring floors

R. P. Farnsworth kept the work moving efficiently on the floors by having four separate crews working at one time on different phases of the operation. By pouring the floor in four separate sections, the contractor was able to have form setters, steel workers, electricians, and the concrete crew working in different quarter sections.

When the form setters had completed a section, the steel workers took over and placed the reinforcing. When they were finished, electricians came in to set the electrical and telephone ducts. And when the electricians had completed their job, the concrete crew poured the quarter section.

By rotating the different trades, the contractor was able to keep all the crews working simultaneously, and to go up one floor in the course of a week's time.

The concrete floors, of joist construction, were formed with overlapping steel pans. These were supported and held in place by double 1×2's between the stringers in the falsework. By pulling these 1×2's, the crews were able to remove the pans 48 hours after a pour, while leaving the joist supports in place until the concrete reached a compressive strength of 2,500 pounds.

The big 2¼-inch reinforcing bars for the columns below the sixteenth floor were set in place individually with the help of a portable tower hoist made by the contractor. The tower, built of 2-inch pipe, was mounted on three wheels, and mounted at the top was a 500-pound-capacity Manning, Maxwell & Moore Budgit hoist run by electricity. When the tower was not needed, it was dismantled and lowered to the ground floor so that it was out of the way of workmen.

A workman uses a Vibro-Plus vibrator to consolidate fresh concrete in a quarter section of the sixteenth floor. Powering the vibrator is the Wisconsin engine mounted on the barrow-like frame.

Separate ducts for telephone and electric lines were set in place before the concrete was poured. This Walkerduct system, manufactured by Walker Brothers, Conshohocken, Pa., contains ⅞-inch risers every 2 feet for maximum flexibility. The risers are just under the surface of the concrete. When it is necessary to tap into one, the riser is located with a finder.

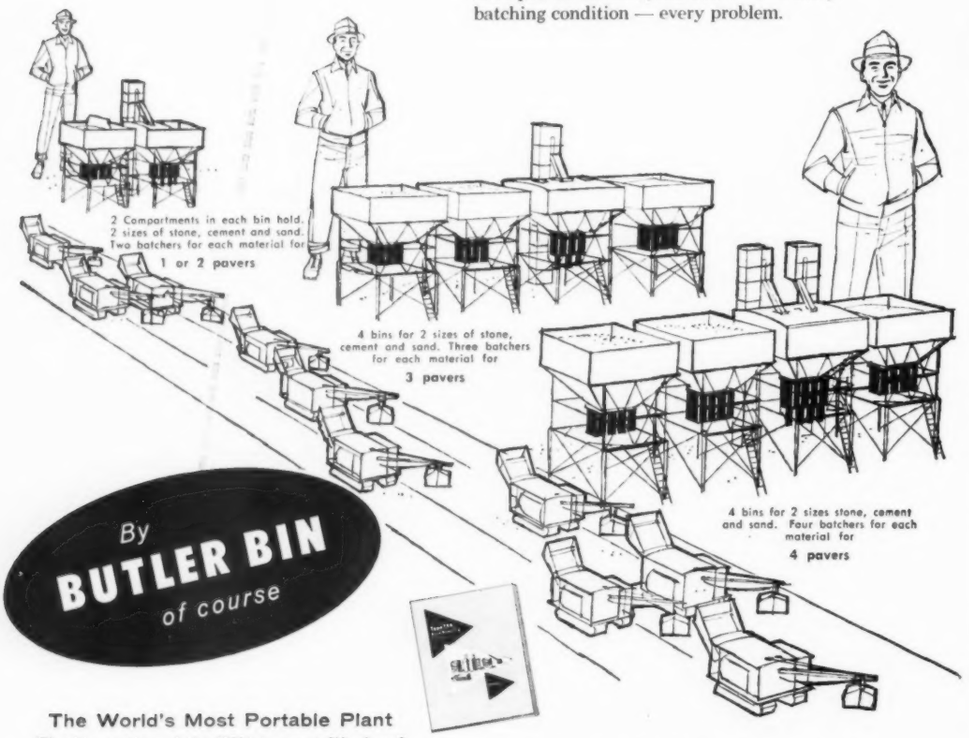
(*Continued on page 103*)

YOUR PROFITS GROW WITH THE TX4

The plant that grows with you . . .

Whether you operate 1, 2, 3, or 4 pavers — there's a BUTLER TX-4 Roadbuilders set-up for you. And as you grow — the same basic plant grows with you. No old equipment to replace . . . you simply add two bins and one batcher to expand a 1 or 2-paver plant to a set-up for 3 pavers. And for 4 pavers you add only one batcher to each of the four bins. Low investment and the highest batching speed the roadbuilding industry has ever known.

And all with only one operator — even the 4 paver set-up. Batching is completely automatic and interlocked. Operation is simultaneous or in sequence. A switch selects topping or base material as required. In short, the TX-4 *meets* every batching condition — every problem.


2 Compartments in each bin hold 2 sizes of stone, cement and sand. Two batchers for each material for 1 or 2 pavers
4 bins for 2 sizes of stone, cement and sand. Three batchers for each material for 3 pavers
4 bins for 2 sizes stone, cement and sand. Four batchers for each material for 4 pavers

By BUTLER BIN of course

The World's Most Portable Plant

The bin section of the TX4 is crane lifted and shipped in one piece. The batchers are in one unit with bracing all in place. No tie-downs or support needed for moving. All wiring and air piping are self-contained ready with quick-connectors for fast "plug-in" hook-up. Support columns ship separately and are hinged to bin, swing into place when crane lifts bin. Bolts are very few in number — all are large and easily handled. Bin rests on foam rubber cushion at top of batcher section, provides a tight, dust and cement proof seal when compressed by two hand-clamps which hold both sections securely. . . Dismantling and re-erection are but a matter of hours instead of days.

The Butler TX4 obsoletes all previous equipment ever built. Read the complete description offered in this new Bulletin. Every part, every component completely illustrated. Send for it today. Just write "TX4" and your address on a postcard.

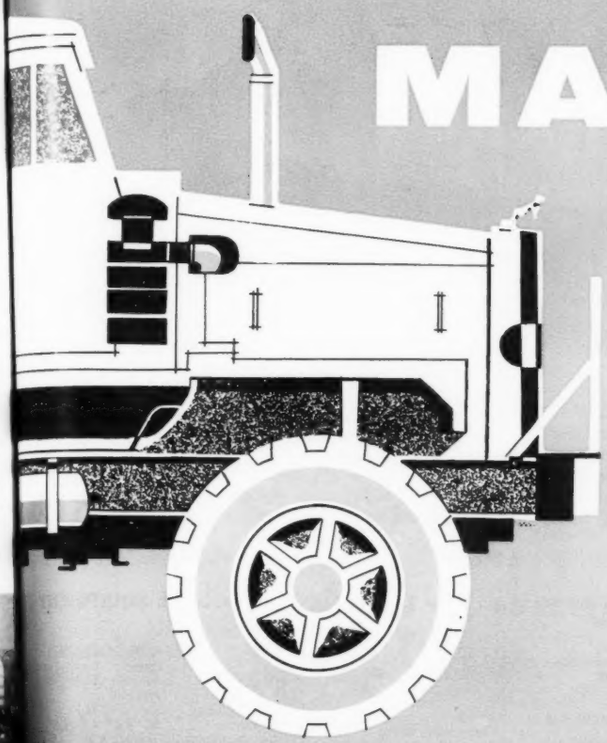
BUTLER BIN COMPANY

971 BLACKSTONE AVE. • WAUKESHA, WISCONSIN

For more facts, use Request Card at page 18 and circle No. 293

NEW MACK heavy-duty four- and six-wheel dumpers

15- to 34-ton capacity



✻ LARGEST SELECTION OF HEAVY DUMPERS

Mack offers you the most complete line of dumpers for mining, quarrying, road building, construction. From heavy-duty 170 horsepower, four-wheel dumpers with 15-ton capacities to super-duty 400-horsepower, six-wheel dumpers with 34-ton capacities, Mack provides the economy and performance that can mean bigger hauling profits for you.

✻ CHOICE OF ENGINES

Mack offers you a choice of engines . . . Cummins diesels in the 300- and 400-horsepower class . . . or Mack Thermodyne and Cummins diesels in the 170 to 205 horsepower class. No need to alter existing maintenance facilities to handle new engine makes . . . you get the truck you want with the engine you want.

✻ OUTSTANDING PERFORMANCE

When you buy Macks, you know that you are getting top performance, outstanding economy, maximum dependability—qualities that have made Mack the acknowledged heavy-duty truck leader in the industry. Moreover, Mack dumpers are planned for accessibility throughout . . . engines are easily reached, no place in the suspension ever needs adjustment—these and many more Mack features reduce maintenance costs and make routine servicing easier. And in Macks, you get the finest transmissions and axles available . . . made by Mack and found only in Macks!

✻ COMPETITIVELY PRICED

Mack off-highway dumpers are priced right in line with competitive makes. Yet, with Macks, you get those "extras" that mean more payloads at lower hauling costs . . . cabs engineered for maximum driver efficiency . . . specially designed components with extensive use of heat-treated alloy steels . . . single-unit all-welded frames that can take plenty of hard knocks . . . outstanding performance and economy from a complete line of engines.

✻ STOCK DELIVERY

All 15 and 22½-ton Mack dumpers are available from stock. The units you want with the engines and transmissions you want can be supplied upon gratifyingly short notice. There are no delays, no production schedules for you to worry about. For more information on delivery, contact your local Mack Dealer or Representative.

MACK LRX

capacity: 15 tons

This four-wheel, off-highway dumper combines a big 15-ton rated capacity with outstanding maneuverability. Either a Mack or Cummins Diesel engine—along with heavy-duty clutch, 10-speed transmission, and Mack's Planidrive rear axle assembly—gives plenty of pulling power for long hauls on steep grades. Rugged, unified frame assembly, powerful air brakes, and comfortable cab with driver's position offset to the left assure the top performance and efficiency that have made the LRX a highly popular dumper in mine, quarry, and road-building operations.

STANDARD EQUIPMENT

DIMENSIONS:	14.00-24 Rear Tire
Wheel Base	13' 4"
Platform	9' 1"
Overall Width	9' 11"
Overall Height	10' 8"
Overall Height (Body Raised)	18' 8"
Overall Length	24' 7½"
Turning Circle Diam. (To outside edge of tire)	60'
Weight (Chassis, Body & Hoist)	33,000 lbs.
Payload	30,000 lbs.

ENGINE (Diesel):

Model	END 673
Make	Mack, Thermodyne
Type	Naturally aspirated
Number of cylinders	Six
Bore and stroke	4⅛" x 6"
Piston displacement, cu. in.	672
Brake horsepower (@ 2100 r.p.m. (gov.)	170
Max. torque (@ 1200 r.p.m.	480 lb.-ft.

CLUTCH (Available with END 673 only):

Type	Mack single-plate, dry
Area of engagement, sq. in.	253

ELECTRICAL SYSTEM:

Voltage and capacity — 12 V., 50 Amp. (24 V., Starting)

TRANSMISSION:

Type	Mack selective, constant mesh
No. of speeds: forward	Ten
reverse	Two

FRONT AXLE:

Make — Mack Reversed-Elliott, drop forged I-beam

REAR AXLE:

Make	Mack Planidrive
Drive	Dual Reduction
Final Drive (3rd reduction)	Planetary gear train within wheel hubs
Total Ratio	16.5

BRAKES (Air):

Compressor	Tu-Flo
Type	Internal expanding
Front, size	17¼" x 5" x ¾"
Rear, size	20" x 7" x ¾"
Hand, size	12" x 5" x ⅜", Bendix

FRAME:

Side-members, size	12⅛" x 6¼" x ½", wide flange I-beam, rolled section
Section modulus	60.7 (per rail)

SPRINGS:

Front, type	Semi-elliptic
Rear, suspension	Semi-rigid, axle mounted to frame

WHEELS:

Type — Cast, spoke

STEERING GEAR:

Control — Manual

TIRES:	Front	Rear
Size	12.00-24 (16P) Rib	14.00-24 (20P) Lug

CAB:

Type: Heavy-duty off-highway, closed, all-steel welded. Offset 10¾" to left of chassis centerline provides clear vision for driver to rear.

CHASSIS EQUIPMENT: Front and rear tow pins; air horn on cab roof; cab entrance steps and platforms; rear view mirror, left side; channel type front bumper; dual windshield wipers; vertical exhaust; stop-tail light; rim lug wrench and handle.

HOIST:

Make & model — Heil
Type-Twin, double-acting, 8" diameter, hydraulic cylinders with 24" stroke, 70° dumping angle.

BODY:

Type	Rock, with scoop end
Make	Heil
Capacity, line of plate	9.8 cu. yds. struck

Construction: ¼" steel plate shell bottom; ⅜" sides and header; ½" wear and side bevel plates; ¼" canopy. 3" x 5 lb. channels between floor plates either side of a 1⅜" edge-grain hardwood middle section filler.

OPTIONAL EQUIPMENT

ENGINE (Diesel):

	NHB	ENDT 673
Model		
Make	Cummins	Mack, Thermodyne
Type	Naturally aspirated	Turbocharged
Number of cylinders	Six	Six
Bore and stroke	5½" x 6"	4⅛" x 6"
Piston displacement cu. in.	743	672
Brake horsepower (@ 2100 r.p.m. (gov.)	200	205
Max. torque (@ r.p.m.	1200	1400-1600
pound-feet	537	560

CLUTCH (Included with NHB and ENDT 673):

Type	Mack two-plate, dry
Area of engagement, sq. in.	416

TIRES:	Front	Rear
Size	13.00-24 (18P) Rib	16.00-25 (20P) Lug

BODY:

Type	Flared Quarry
Make	Heil
Capacity, line of plate	11 cu. yds. struck

Construction: ¼" steel plate shell bottom; ½" side ½" header, slope; ⅜" header, vertical; ½" wear pa ¼" canopy. 3" x 5 lb. channels between floor plates e side of a 1⅜" edge-grain hardwood middle section fille

Body Equipment: (for std. and opt. bodies) (9-¼ alloy wear bars; rock ejectors; ½" alloy wear pa horizontal bolsters (3 per side); canopy, loose for ex shipment, (for std. body only); exhaust heating co tions; welded-on side boards.

CHASSIS EQUIPMENT: Automatic radiator shut Wagner "BB" (24 hour chart 0-3500 r.p.m.) tachogr in place of standard Tachometer; speedometer; hu ometer, left front wheel; Vickers power steering wheel limiting valve; hand control valve to operate service brakes; low air pressure indicator. Wig type; screen type radiator guard; 25,000 B.T.U. hot w cab heater with defrosters; spare rim; hydraulic j 20-ton; air starting; cold starting equipment; insu dash mat.

MACK LVX
capacity: 22½ tons

This four-wheel dumper with its 22½-ton rated capacity provides maximum payloads at minimum unit cost. Equipped with either a 300 or 335-horsepower engine, over-gear transmission with two-speed compound or torque converter, and Mack's exclusive Planidrive rear axle assembly, it is powered to give top performance under the most punishing operating conditions. All-welded, single-unit, alloy-steel frame gives LVX's stamina and rugged durability. Elbow steering column, hydraulic steering booster, two-plate air-assisted clutch, and job-engineered cab with extreme left driver position assure maximum operating efficiency. From top to bottom, this big Mack gives you the "extras" that mean minimum hauling costs.

CONDENSED SPECIFICATIONS

STANDARD EQUIPMENT

DIMENSIONS:

Wheelbase	14' 2"
Platform	9' 11"
Overall Width	11' 2"
Overall Height	11' 4⅝"
Overall Length	26' 7½"
Overall Height (Body Raised)	21'
Turning Circle Diam. To outside edge of tire	62'
Weight (chassis, body & hoist)	40,800 lbs.
Payload	45,000 lbs.

ENGINE (Diesel):

Model	NHRBIS
Make	Cummins
Type	Supercharged
Number of cylinders	Six
Bore and stroke	5½" x 6"
Piston displacement, cu. in.	743
Brake horsepower (@ 2100 r.p.m. (gov.)	300
Max. torque (@ 1500 r.p.m.	818 lb.-ft.

CLUTCH:

Type	Mack Two-plate, dry
Area of engagement, sq. in.	416
Actuation	Manual, with air assist

ELECTRICAL SYSTEM:

Voltage and capacity	12 V., 50 Amp. (24 V. Starting)

TRANSMISSION:

Type	Mack selective, constant mesh
No. of speeds, forward	Eight
reverse	Two

FRONT AXLE:

Type . . . Mack Reversed-Elliott, drop forged I-beam

REAR AXLE:

Make	Mack Planidrive
Drive	Dual Reduction, spiral bevel
Final drive (3rd reduction)	Planetary gear train within wheel hubs
Total Ratio	17.66

BRAKES (Air):

Compressor	Tu-Flo
Type	Internal expanding
Front size	17¼" x 5" x ¼"
Rear size	18" x 10" x ¼"
Hand size	12" x 5" x 3/8"

FRAME:

Type	I-beam, wide flange
Material	Alloy steel
Side-members, size	13¹¹/₁₆" x 8" x ⅝" (Fabricated)
Section modulus	74.8 per rail

SPRINGS:

Front	
Type	Semi-elliptic
Suspension	Mack rubber shock insulators
Rear	
Type	Progressive rate, semi-elliptic
Suspension	Cam face slipper ends with radius rods

TIRES:

	Front	Rear
Size	14.00-24 (16P) Rib	18.00-25 (24P) Lug

WHEELS:

Type . . . . . Cast, spoke

STEERING GEAR:

Power steering assist . . . Vickers hydraulic booster

CAB:

Type . Heavy-duty off-highway, closed, all-steel, welded. Cab offset 10½" to left of chassis centerline provides clear vision for driver to rear.

CHASSIS EQUIPMENT: Screen type radiator guard; front and rear tow pins; air horn on cab roof; dual windshield wipers; two air reservoirs; rear view mirror, left side; Mack power take-off and control (not available with Allison Transmission); door in hood side for access to oil filler and dip stick; exhaust through hood with inline muffler; channel type front bumper; stop-tail light; rim lug wrench and handle.

HOIST:

Type . . . Twin, double-acting, outboard mounted, three section telescopic cylinder assembly directly connected to body and chassis through a universal joint arrangement providing a 70° dumping angle.

BODY:

Type	Rock, with scoop end
Make	Heil
Capacity, line of plate	14.8 cu. yds. struck

Construction: ¼" steel plate shell bottom; ⅜" sides and header; ½" wear and side bevel plates; ¼" canopy. 3" x 7.1 lb. channels between floor plates either side of a 2" edge-grain hardwood middle section filler.

OPTIONAL EQUIPMENT

ENGINE:

Model	NRTO
Make & type	Cummins, turbocharged
Number of cylinders	Six
Bore and stroke	5½" x 6"
Piston displacement, cu. in.	743
Brake H.P. (@ 2100 r.p.m. (gov.)	335
Max. torque (@ 1500 r.p.m.	900 lb.-ft.

TRANSMISSIONS:

Westinghouse Converter and Mack 4-Speed Transmission. Clutch 2-plate, 17", air actuated.
Allison Torqmatic Converter and Allison Transmission.
Twin Disc Converter and Mack 4-Speed Transmission.

FRONT AXLE: Special Heavy-duty, Reversed-Elliott, Drop-Forged I-beam.

TIRES:

	Front
Size	14.00-24 (20P) Rib

BODY:

Type	Flared Quarry
Make	Heil
Capacity, line of plate	15.2 cu. yds., struck

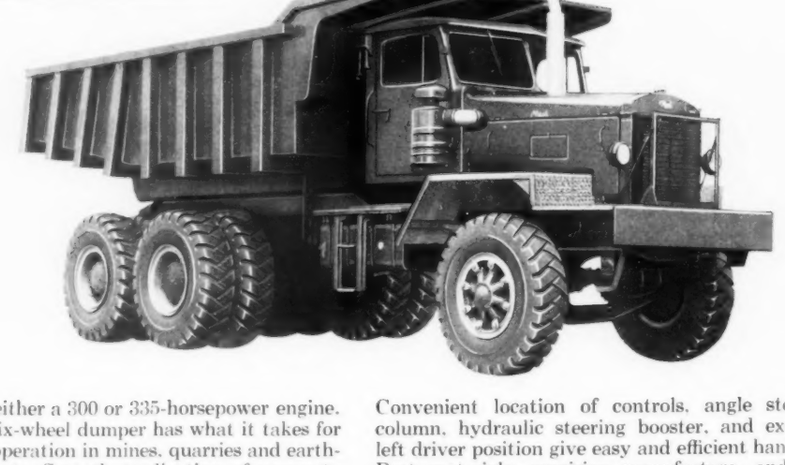
Construction: ¼" steel plate shell bottom; ½" sides; ⅜" header; ½" wear and side bevel plates; ¼" canopy. 3" x 7.1 lb. channels between floor plates either side of a 2" edge-grain hardwood middle section filler.

Body Equipment: (for std. and opt. bodies): (9) ¾" x 6" alloy wear bars; rock ejectors; horizontal bolsters (3 per side); canopy toe board; rock guards over tires; canopy, loose for export shipment. (for std. body): welded-on side boards; exhaust heating connections.

CHASSIS EQUIPMENT: Air starting, Ingersoll-Rand 9HP; Tachograph, Wagner "BB" (24 hour chart 0-3500 r.p.m.) in place of standard Tachometer; Wig-Wag low air pressure indicator; hand control valve to operate rear service brakes; front wheel brake limiting valve; 25,000 B.T.U. hot water cab heater with defrosters; windshield fan mounted on windshield header; hubodometer; engine chrome cylinder liners and stellite inlet valve seats; insulating dash mat; fender to bumper treads; air operated radiator shutter; air operated Thermo-controlled radiator fan hub; speedometer; back-up light; hydraulic jack, 30-ton; spare rims.

MACK LRSW

capacity: 30 tons



Powered by either a 300 or 335-horsepower engine, this 30-ton, six-wheel dumper has what it takes for off-highway operation in mines, quarries and earth-moving projects. Smooth application of power to its balanced, four-wheel drive bogie is obtained by an air-assisted clutch and overgear transmission with two-speed compound or torque converter. Convenient location of controls, angle steering column, hydraulic steering booster, and extreme left driver position give easy and efficient handling. Best materials, precision manufacture, and specially engineered components make the LRSW capable of withstanding the toughest 'round-the-clock hauling.

CONDENSED SPECIFICATIONS

STANDARD EQUIPMENT

DIMENSIONS:

Wheelbase	16' 10"
Platform	14' 11½"
Overall Width	11' 2⅛"
Overall Height	11' 6½"
Overall Length	29' 2⅛"
Overall Height (Body Raised)	24' 10"
Turning Circle Diam. — To outside edge of tire	78'
Weight (chassis, body & hoist)	60,000 lbs.
Payload	60,000 lbs.

ENGINE (Diesel):

Model	NHRBIS
Make	Cummins
Type	Supercharged
Number of cylinders	6
Bore and stroke	5½" x 6"
Piston displacement, cu. in.	743
Brake horsepower @ 2100 r.p.m. (gov.)	300
Max. torque @ 1500 r.p.m.	818 lb.-ft.

CLUTCH:

Type	Mack two-plate, dry
Area of engagement, sq. in.	416
Actuation	Manual, with air assist

ELECTRICAL SYSTEM:

Voltage and capacity	12 V., 50 Amp. with 24 V., starting

TRANSMISSION:

Type	Mack two-lever, Duplex
No. of speeds, forward	Eight
reverse	Two

FRONT AXLE:

Type	Mack Reversed-Elliott, drop-forged I-beam

BOGIE:

Make	Mack Planidrive
Final drive, type	Four-wheel, planetary
Inter-axle differential, type	Mack concentric cam and plunger Power Divider
Carriers	Mack Dual Reduction
Total Ratio	18.18

BRAKES:

Type and actuation	Internal expanding, inclosed, air
Front, size	17½" x 5" x ¾"
Rear, size	20" x 7" x ¾"
Hand, size	12" x 5" x ¾"

FRAME:

Type	I-beam, wide flange
Material	Alloy steel
Side-members, size	13⅛" x 8" with ⅝" web and top flange, ⅞" bottom flange
Section modulus	84.5 per rail

SPRINGS:

Type, front	Semi-elliptic
rear	Semi-elliptic, inverted
Suspension, Mack	Rubber Shock Insulators

SHOCK ABSORBERS, FRONT:

Type	Houdaille, hydraulic

TIRES (Lug):

	Front	Rear
Size	14.00-24 (20P)	16.00-25 (20P)

WHEELS: Cast, spoke

STEERING GEAR:

Power steering assist	Vickers hydraulic booster

CAB:

Type	Heavy-duty, off highway, closed, all-steel, welded. Offset 10¼" to left of chassis center-line provides clear vision for driver to rear.

CHASSIS EQUIPMENT: Hubodometer; screen type radiator guard; front and rear tow pins; air horn; rear view mirror, left side; exhaust through hood with in-line muffler; channel type front bumper; door in hood side for access to oil filler and dip stick; insulating dash mat; wig-wag low air pressure indicator; windshield wipers; stop and tail light; back up light; rim lug wrench and handle; automatic radiator shutters.

HOIST:

Make	Heil
Type	Twin, double-acting, 10" diameter, hydraulic cylinders with 40" stroke; 70° dumping angle with power return.

BODY:

Make and type	Heil, Rock-scoop end
Capacity, line of plate	21 cu. yds.
Construction:	¼" steel plate shell bottom; ⅜" sides and header; ½" slope section; ½" alloy wear and side bar plates; ¼" canopy, 3" x 7.1 lb. channels between plates either side of a 2" edge-grain hardwood mid section filler.

OPTIONAL EQUIPMENT

ENGINE:

Make and model	Cummins, NRTO
Number of cylinders	Six
Bore and stroke	5½" x 6"
Piston Displacement cu. in.	743
Brake horsepower @ 2100 r.p.m. (gov.)	335
Max. torque @ 1500 r.p.m.	900 lb.-ft.
Turbocharger	Turbine, exhaust driven

TRANSMISSIONS:

Westinghouse Converter and Mack 4-Speed Transmission — Clutch—2-plate, 17", air actuated.

Allison Torqmatic Converter and Allison Transmission

WHEELS, TIRES:

Front & rear Wheels, type	Cast spoke
Tires, size	16.00-25
Ply-rating, front	20 or 24
rear	24

BODY EQUIPMENT: (9) ½" x 6" alloy wear bars; alloy wear plate; rock ejectors; horizontal bolsters 4 per side); twin body prop; rock guards over tires; exhaust heating connections; canopy, loose (for export shipment)

CHASSIS EQUIPMENT: Air starting, Ingersoll-Rand 9HP; chrome cylinder liners and stellite inlet valve seats; air operated Thermo-controlled radiator fan hub; Tachograph, Wagner model "BB" (24 hour chart 0-3500 RPM) in place of standard Tachometer; speedometer; front wheel brake limiting valve; alcohol vaporizer; cab insulated; exhaust outlet under cab suitable for attachment to body for body heating; 25,000 B.T.U. hot water cab heater with defrosters; solex glass for windshield; windshield fan mounted on windshield header; fender and bumper steel treads; two stop-tail lights; 20-ton hydraulic jack; spare rim.

MACK — FIRST

MACK LRVSW

capacity: 34 tons

The 34-ton rated capacity of this super-payload, six-wheel dumper assures minimum haulage costs for the big earth-moving jobs. Equipped with a 400-horsepower engine, four-speed overgear transmission, hydraulic torque converter or two-speed compound, and a balanced, four-wheel drive bogie, LRVSW's can negotiate severe grades fully loaded. Maneuverability and ease of handling are facilitated by such features as a hydraulic steering booster and air-assisted clutch. Heat-treated, stress-proportioned, single-unit frame gives the structural stamina needed to withstand severest operating conditions. All these features, and many more, contribute to unmatched durability and minimum haulage costs.

CONDENSED SPECIFICATIONS

STANDARD EQUIPMENT

DIMENSIONS:

Wheelbase	16' 10"
Axle to rear of frame	14' 11½"
Overall Width	11' 2⅜"
Overall Height	11' 7⅝"
Overall Length	31' 3⅛"
Overall Height (Body Raised)	25' 2"
Turning Circle Diameter (To outside edge of tire)	78'
Weight (chassis, body & hoist)	68,000 lbs.
Payload	68,000 lbs.

ENGINE (Diesel):

Model	NVH-1200
Make	Cummins
Type	Naturally aspirated
Number of cylinders	12
Bore and stroke	5½" x 6"
Piston displacement, cu. in.	1486
Brake horsepower (@ 2100 r.p.m. (gov.)	400
Max. torque (@ 1200 r.p.m.	1,075 lb.-ft.
Fuel tank and location	150 gal., back of cab

CLUTCH:

Make	Lipe Rollway
Type	Two-plate, dry
Area of engagement, sq. in.	571
Actuation	Air

ELECTRICAL SYSTEM:

Voltage and capacity	12 V., 75 Amp.
Generator, make and type	Leece-Neville, alternator

STARTING SYSTEM:

Starting motor, type	Air
Make	Bendix-Westinghouse
Rating, horsepower	25
Cold starting aid	Ether injection

TRANSMISSION:

Type	Mack selective constant mesh
No. of speeds, forward	Four
reverse	One

TORQUE CONVERTER:

Make	Westinghouse 18"
Type	Single stage, hydraulic

FRONT AXLE:
Type . . . Mack Reversed-Elliott, drop-forged I-beam

BOGIE:

Make	Mack Planidrive
Final drive, type	Four wheel, planetary
Inter-axle Differential	Mack concentric cam and plunger type Power Divider
Carriers	Mack Dual Reduction
Total ratio	18.18

BRAKES:

Type and actuation	Internal expanding, inclosed, air
Front, size	17½" x 5" x ⅛"
Rear, size	20" x 7" x ½"
Hand, size	12" x 5" x ⅜"

FRAME:

Type	I-beam, wide flange
Material	Alloy steel
Side-members, size	Depth 14¼", flange width 8", flange thickness 1"
Section modulus	130.0 per side

SPRINGS:

Type	Semi-elliptic
Suspension, Mack	Rubber Shock Insulators

SHOCK ABSORBERS, FRONT:
Type . . . Houdaille, hydraulic

TIRES (Lug) Front and Rear:
Size . . . 16.00-25 (20P)

WHEELS:
Type . . . Cast, spoke

STEERING GEAR:

Type	Worm and roller
Power steering assist	Vickers hydraulic booster

CAB:
Type . . . Heavy-duty off-highway, closed, all-steel, welded. Offset 10⅛" to left of chassis center-line provides clear vision for driver to rear.

CHASSIS EQUIPMENT: Screen type radiator guard; hubodometer; front and rear tow pins; air horn; rear view mirror, left side; dual exhaust through hood with inline mufflers; channel type front bumper; rim lug wrench and handle; door in hood side for access to oil filler and dip stick; insulating dash mat; windshield wipers; stop and tail light; back up light; automatic radiator shutters.

HOIST:

Make & Type	Heil, twin, double-acting, outboard mounted, four-section telescopic cylinder assembly directly connected to body and chassis through a universal joint arrangement to provide maximum flexibility.
Dumping angle	70°

BODY:

Make & Type	Heil Rock, scoop end
Capacity, line of plate	24 cu. yds. struck

Construction: ¼" steel plate shell bottom; ⅜" sides and header; ⅓" alloy wear and side bevel plates; ½" front slope plate; ¼" canopy. 3" x 7.1 lb. channels between floor plates either side of a 2" edge-grain hardwood middle section filler

OPTIONAL EQUIPMENT

TRANSMISSION (In place of 4-Speed and Westinghouse Converter):

Make & Type	Mack Two-Lever, Duplex
Speeds Forward	8
Speeds Reverse	2

TIRES (Lug) Front and Rear:
Size . . . 16.00-25 (24P)

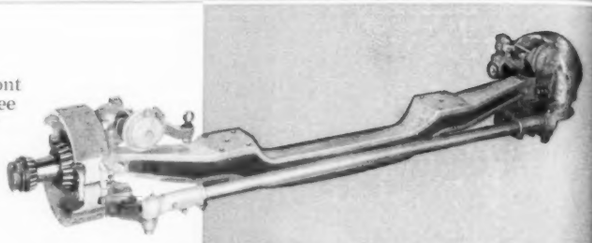
BODY EQUIPMENT: (9) ¾" x 6" wear bars over standard ⅓" alloy wear plate; 1" alloy wear plate in place of ⅓" alloy wear plate; exhaust heating; rock ejectors; rock guards over tires; twin body prop; horizontal bolsters (5 per side).

CHASSIS EQUIPMENT: Air operated Thermo-controlled radiator fan hub; Tachograph, Wagner model "BB" (24 hour chart 0-3500RPM) in place of standard Tachometer; speedometer; front wheel brake limiting valve; alcohol vaporizer; 25,000 B.T.U. hot water cab heater with defrosters; solex glass for windshield; windshield fan mounted on windshield header; fender to bumper steel treads; cab insulated; two stop-tail lights; spare rim; 20-ton hydraulic jack.

only MACK gives you features like these...

MACK-BUILT FRONT AXLES

Mack's reversed Elliott, drop-forged I-beam front axles are made extra strong for long, trouble-free service. Extensive use of heat-treated steels for crucial parts means minimum maintenance. Straight tie rod and rugged construction of air-actuated brake shoes insure top performance.

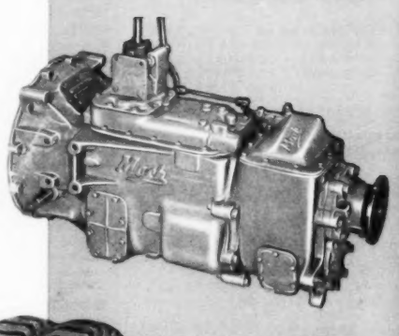


MACK-BUILT 2-WHEEL REAR AXLES

Mack's two-wheel, rear axle assemblies have an unmatched reputation for durability under strenuous service. The strongest, most wear-resistant materials are used throughout. Dual Reduction, gear-type differential and Mack's famous planetary gear reduction at the wheel hubs (Planidrive) provide the smooth distribution of power needed for top truck performance. Planetary gears can be serviced or repaired without removing tires or disturbing wheel bearing adjustment.

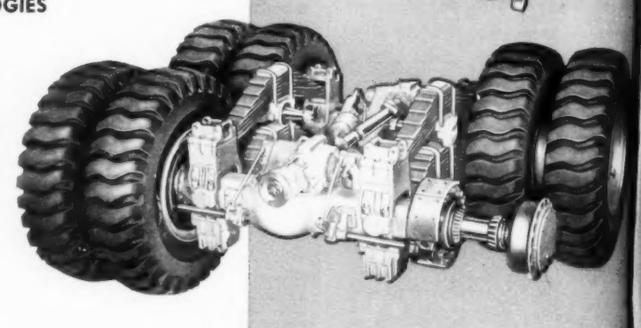
MACK-BUILT TRANSMISSIONS

Dependable performance and long life are standard in Mack transmissions. Shown here is the heavy-duty overgear transmission used for the LRVSW, LRSW, and LVX off-highway dumpers. The four-speed main transmission and two-speed compound are assembled as a unit to give eight forward and two reverse speeds. The four-speed main transmission without the two-speed compound is offered in combination with torque converter. All gears use Mack tetrapoid or quadrapoid tooth design and are drop-forged and case-hardened . . . gears noted for lasting the life of the truck.



MACK-BUILT 4-WHEEL BALANCED BOGIES WITH EXCLUSIVE POWER DIVIDER

Under the worst conditions of mud, loose gravel, or difficult terrain, you get maximum pulling power with Mack's four-wheel drive Balanced Bogies because exclusive Mack Power Dividers apply power to the wheels with traction. Planidrive final reduction gears in all four hubs provide needed reduction without excessively large carriers, differentials, or axle shafts. Maintenance is reduced to a minimum.



MACK first name for TRUCKS

Mack Trucks, Inc., Plainfield, New Jersey • In Canada: Mack Trucks of Canada, Ltd.

(Continued from page 96)

Gasoline-powered Prime Mover buggies speeded the flow of concrete from the tower hopper to the quarter section being poured. Concrete was consolidated by Vibro-Plus and Dreyer vibrators powered by Wisconsin gasoline engines. Whiteman rotary finishing machines were used to finish the concrete. The floor was cured by a $^3/_4$-inch layer of wet sand, which was kept in place for about two weeks. The wet sand not only slowed the cure of the concrete, but protected the slab from drippings as the floor above was being poured.

Some early problems

The new building has a partial basement, occupying the westerly portion of the lot. Excavation for the basement went down 20 feet below street level, while the remainder of the area was excavated to about seven feet below street level.

Steel workers use a portable, shop-built handling rig of 2-inch tubing, mounted on three wheels, to set a prefabricated box of column steel on the sixteenth floor. The rig can be dismantled when not needed on the crowded floor.

In handling this early phase of the work, the contractor drove sheet piling rented from L. B. Foster, Houston, Texas, at the edges of the area, except where the excavation went down against the face of adjoining basement walls. At this time, sheet piling was also driven along the line that separated the partial basement from the 7-foot cut under the remainder of the building.

A Koehring 605 crane, using both clamshell and dragline buckets, excavated the entire area to 7 feet below street grade. The crane then completed the 20-foot cut in the partial basement, loading the excavation into dump trucks.

Although the adjoining basement walls made it unnecessary for the contractor to drive sheet piling, a considerable amount of time was needed to strip off the old wood forms that encased the walls. The basement walls of the new building were poured up against the walls of the old structures.

The structure is supported by 681 piles, which were driven by Raymond Concrete Pile Co., New York City. In the partial basement, the thin-shelled piling was driven to depths of between 60 and 65 feet by a Raymond skid rig with a steam-operated hammer and mandrel. These corrugated metal piles were filled with concrete. On the level 7 feet below the street, the piles were driven to an 80-foot depth by a Koehring 1005 crane with swinging leads and a Raymond steam-operated hammer.

Personnel

The general superintendent for R. P. Farnsworth is Sidney Guiliot, who is assisted by Jack Stephens, Buck Ballard, and Bill Kaiser. William H. Henkel is the representative on the job for Nolan, Norman & Nolan.

THE END

"We have such high-pressure machinery, we decided to employ low-pressure selling."

BEAUTY...OR BEAST?

We'd be the last to claim that Amsco® Dippers have any inherent glamour. That's why we induced the pert 115-pound* blond to pose in one of our 7-yd. dippers at a recent trade show. Got a lot of attention, too!

But we know that experienced operators *specify* these all-cast Manganese Steel Dippers because they're real "beasts"—when it comes to strength and ruggedness. By way of proof, glance at the other photo. It shows a 9-yd. Amsco Dipper hoisting a 60 to 70-ton* rock out of the St. Lawrence Seaway Channel. There's plenty more proof available, too—on the extra strength, digging ability and long life of Amsco Dippers. That's why they're the number one original-equipment choice on most leading makes of power shovels!

Consult your equipment manufacturer, or write us direct for new booklet on *Amsco Power Shovel Equipment*, giving detailed reasons why Amsco Dippers are real "beasts" when it comes to rugged digging work.

*Estimated

AMERICAN Brake Shoe COMPANY

AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DEL., OAKLAND, CAL., ST. LOUIS, JOLIETTE, QUEBEC

For more facts, use Request Card at page 18 and circle No. 295

The tough gumbo soil is loaded by two Euclid scrapers, one pushed by an Allis-Chalmers HD-21, the other by a Euclid TC-12. When the material becomes too wet, the earthmovers are shifted into the sand area to continue work.

Tough work in sand, gumbo brings heavy runway to grade

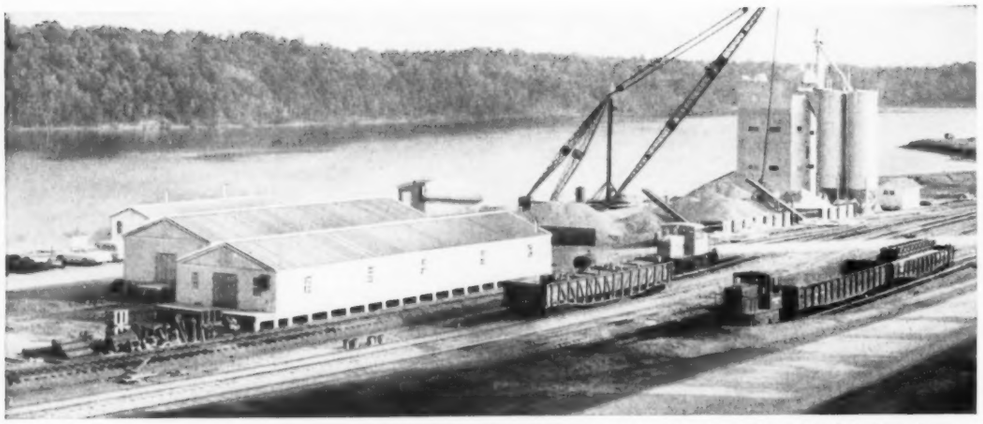
A sandbar formed in an ancient lake thousands of years ago by waves and wind has been transformed again—by construction machinery and contractors—into a modern runway for a new Air Force base. Designed by the Omaha District of the U. S. Army Corps of Engineers, and with construction supervised by the Air Force, the base lies about twelve miles west of Grand Forks, N. Dak., and forms one of the closing links in the chain of bases stretching from ocean to ocean across the northern border of the country.

The development of the site for the runway, done thousands of years ago by natural forces, played an important part in subsequent construction. As the glaciers of the ice age receded from the plains of north-central America, the melting ice formed Lake Agassiz, and in the muddy bottom of this great shallow lake, wind and waves formed long, narrow sandbars running in a north-south direction. The lake dried up, its bottom became the fertile plains of the eastern Dakotas, northwestern Minnesota, and the Canadian provinces of Manitoba and Saskatchewan.

The makeup of the runway area, a long ridge of sand in the midst of an almost limitless area of heavy clay gumbo, was a major factor in its selection as the site of the runway, in the design of the facility, and in some of the problems that beset the contractor during the job.

When work on the $5 million runway got under way, the contractor, S. J. Groves & Sons Co., Minneapolis, Minn., found the sand particularly useful in keeping men and equipment busy when wet weather and soil conditions made the gumbo impossible to handle. Whenever possible, however, crews and equipment worked at grading the gumbo.

Probably the greatest difficulty in building the runway was caused by the combination of the heavy clay soil and extremely cold winter weather. With the exception of the Lake Agassiz sandbars, practically the entire area is underlaid with the gumbo, which is very susceptible to frost action, often freezing to a depth of 6 feet or more. Upon thawing, this soil becomes saturated with moisture and loses practically all its



Of the 88 Armco Steel Buildings at the new Allen Steam Plant of the Duke Power Company, nearly half of them are at their third site. An equal number are at their second location.

These Armco Steel Buildings are at Their **Third** Power Plant Construction Site

Erected three times at different sites . . . and ready to go again!

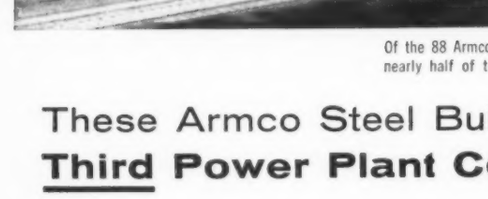
That's the record of 37 Armco Steel Buildings used by the Duke Power Company to house workers and machines during construction projects at their various power plants in the Carolinas.

Formerly, wooden buildings were erected at construction sites and later abandoned because relocation was too costly. Then, in 1950, the Duke Power Company erected 37 Armco Buildings—bunkhouses, family-type houses, foremen's offices and tool rooms—during expansion of their Buck Steam Plant. Upon completion of work here, the buildings were dismantled and re-erected for construction crews at the Dan River Plant site.

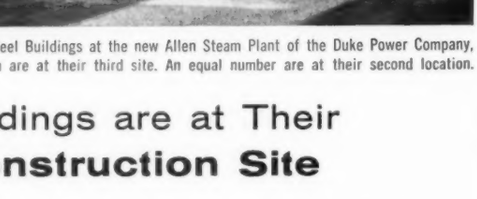
Recently, ground was broken for the new Allen Steam Plant. The Armco Buildings, already used at two previous construction sites, were again dismantled and re-erected—*their third location.*

* * *

Armco Steel Buildings are available in more than 5,000 sizes, in clear-span widths from 5'-4" to 100'. Offering high quality at lower cost, they are widely used by contractors, engineers, industries, municipalities and highway departments. Armco Drainage & Metal Products, Inc., 5647 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.



These 16- by 60-foot Armco Buildings in the foreground have been dismantled, moved and re-erected twice. First time they were moved 90 miles; the second time it was 140 miles.



One of the many Armco Steel Buildings used by the Duke Power Company as a family-type house. The 24- by 32-foot structure is at its third location.

For more information and prices on Armco Steel Buildings, Call Western Union and ask for Operator 25

Armco Construction Products

For more facts, use Request Card at page 18 and circle No. 296

Sandbar of glacial lake provides material for 72-inch-deep base and paving; design of Air Force base runway is modified for heavy bombers

A Caterpillar DW21, pushed by a Cat D9, loads select material. This combination, with both rigs equipped with turbochargers to step up engine horsepower, worked well in the sand and was kept on this operation constantly.

stability. In fact, the runway designers assumed a CBR value of 3 for the subgrade.

Because of this, the runway, taxiways, and aprons are designed with an over-all depth of 72 inches. The lower 3 feet or more of this depth is select subgrade material, obtained from the sandbar. Subsequent courses were 4 to 6 inches of filter gravel, 7 to 14 inches of compacted gravel base, and concrete paving ranging from 11 to 21 inches deep.

The runway, originally designed to be 7,500 feet long and 150 feet wide to accommodate fighter planes, called for 1,000-foot concrete sections at each end and intermediate sections of flexible pavement.

Plan for bombers

About the time that grading was substantially complete, and the select subbase was being placed, it was decided to modify the design so that the field could accommodate bombers of the Strategic Air Command. This meant a longer, wider, and stronger runway.

Plans were immediately made to change the design to an all-concrete runway, with 21 inches of concrete for the end sections and 18 inches in the intermediate section. The 75× 9,000-foot taxiway which connects the parking aprons with both ends of the runway was strengthened to 16 and 18-inch concrete slabs. Steps were also taken to extend the length and increase the width of the runway for the larger planes.

Fortunately, the 72-inch over-all depth of base and paving allowed plenty of latitude for these required changes without any appreciable waste or reconstruction of the work already done.

Weather affects construction

In addition to its influence on the runway design, the cold winter weather and deep frost affected the contractor's planning and operations. Token work was started during the winter, but because of the deep frost, and soft, wet subgrade, grading operations could not actually get under way until spring. This meant that the contractor had less than six months to complete practically all

(*Continued on next page*)

JAEGER'S 50 CFM MORE AIR SPEEDS RUSH WORK

By producing 365, not 315, cfm of 100 lb. air, this Jaeger Rotary is operating six 80 lb. breakers at full efficiency to finish a rush job in busy Benjamin Franklin Parkway, Philadelphia. Full load speed only 1700 rpm.

FULL AIR PRESSURE AT 5200′ ELEVATION

Installing cable for Denver, Colorado utility, this Jaeger "125" Rotary is holding full pressure in two Thor heavy duty breakers. Full load speed is only 1700 rpm. Jaeger originated the 125 cfm compressor rating.

JAEGER'S 125 AND 250 CFM SIZES ON 2-WHEELS

Jaeger 125 and 250 rotaries give you the advantages of Jaeger's higher efficiency (1700 rpm full load speed instead of 1800-1950), plus full size tool boxes, retractable pneumatic-tired dolly wheel and 8-hour fuel tanks, with 2-wheel mounting. Four-wheel units are available in 365 and 600 cfm sizes.

Your Jaeger distributor will gladly give you full details and demonstration — or let us send you Catalog JCR-5.

THE JAEGER MACHINE COMPANY

701 Dublin Avenue, Columbus 16, Ohio

Jaeger Machine Co. of Canada, Ltd., St. Thomas, Ontario

For more facts, use Request Card at page 18 and circle No. 297

A manipulator consisting of 13 motor-grader scarifier teeth, arranged in two rows, is carried on the rear of this Cat D8 which works over the heavy gumbo soil.

Compaction of the gumbo is handled here by two Cat D8's pulling LeTourneau-Westinghouse 120 sheepsfoot rollers.

Continued from preceding page

the work included in the $5 million contract.

During winter and early spring, and despite the fact that North Dakota road limits seriously affected equipment assembly, grading rigs were brought to the site, clearing done, and offices and shops set up. This move was made at just the right time: the deep frost permitted the heavy equipment to be hauled over roads that were impassable later in the season.

Clearing groves of trees from the building areas, done under a subcontract by Bob Benson, Arvilla, N. Dak., was handled by a Caterpillar D7 tractor-dozer with a special root knife attachment on the dozer blade. This rig was able to cut down through the frost to sever tree roots below ground surface.

The trees and brush were pushed up into piles by the tractor-dozers to be burned. The biggest difficulty came in disposing of the heavy trunks and stumps, which did not burn well, after the branches and smaller pieces had been burned.

Grading operations

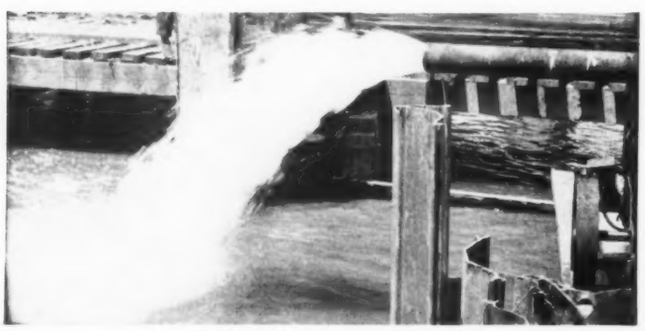
As topsoil was stripped from all areas to be excavated, it was stockpiled for use in the 4-inch lift placed on all shoulder and ditch slopes.

The wet condition of the subgrade stalled the start of full-scale grading operations until late spring, when the several spreads of scrapers were able to get a footing. Within the next five weeks, they moved more than a million cubic yards of material.

The runway and taxiway were graded up so that they resembled two ridges with a wide, flat ditch between and similar ditches on both sides. The finished runway has 1 per cent transverse grades from a high point at the center, while the cross slope on the taxiway is 0.5 per cent. From the edges of the pavement, the ditches slope at 2 per cent grades to the low points. These ditches beside the runway were the principal source of the select subbase material.

Runway cuts ranged from nothing to 6 feet while fills in areas off the runway and taxiway were built up to a maximum of 10 feet. The flat ditches lead to a deeper drainage ditch which finds an outlet in the Turtle River.

Much of the million cubic yards of earth moved to grade the runway, taxiway, aprons, and ditches was wasted in low areas or used to build up an overrun area at the end of the runway. More than 600,000 cubic yards of sand that came out of the



Quick way to measure 90,000 gallons

Given a tight suction line and 10 ft. static lift, a 90M Rating Plate on a new pump guarantees that you can pump at least 90,000 gph (1500 gpm) against a 25 ft. head. Capacity at higher lifts and heads is certified by the same standards.

For pumps from as small as 1000 gph to as large as 125,000 gph, AGC standards and Rating Plates give you this needed information and guarantee its correctness. In addition, AGC standards guarantee ample engine power and up-to-date design to assure you of satisfactory service from any rated pump.

To maintain these helpful standards, demand the AGC Rating Plate on any pump you buy.

90M
(90,000 G.P.H.)
THIS PUMP COMPLIES WITH
A.G.C. STANDARDS
FOR SELF PRIMING CENTRIFUGAL PUMPS

Demand this Rating Plate for your protection.

CONTRACTORS PUMP BUREAU

Affiliated with The Associated General Contractors of America
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BARNES MFG. CO. Mansfield, Ohio	**ESSICK MFG. CO.** Los Angeles, Calif.	**JACUZZI BROS., INC.** Richmond, Calif.
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WORTHINGTON CORPORATION, Contractor's Pump Division, Plainfield, N. J.

For more facts, use Request Card at page 18 and circle No. 298

New Tennant "80" Sweeper:

it picks up the dirt most sweepers miss

Over 80% of all "critical area" sweeping jobs in the U.S. today are done with TENNANT vacuum-equipped Power Sweepers.

This is because these heavy-duty units are expressly engineered to provide unusual dust control—*the closest approach to dust-free sweeping yet developed.*

The Tennant "80" sweeps a 42" path (53" with sidebrush), picks up *all* types of litter on-the-run, dumps hydraulically. *Write for illustrated bulletin.*

G. H. TENNANT CO., 753 North Lilac Drive, Minneapolis 22, Minn.

TENNANT **POWER SWEEPERS**

SETS A NEW STANDARD IN **CLEAN** SWEEPING

For more facts, use Request Card at page 18 and circle No. 299

A service crew of three lubricate a Euclid tractor-scraper in the field. Daily servicing during each shift is done with this Graco lube van, which carries lubricants, motor oil, and water.

A neat and efficient field office is provided by the 28-foot International trailer, left, the 41-foot Florence trailer, right, and the 16×20-foot room built between them. Business is transacted in the central room.

ditches was placed on the subgrades as select subbase material.

A fleet of 21 rubber-tire scrapers and three tractor-drawn scrapers handled most of the earthwork. Six of the scrapers were Caterpillar DW21's and the other 15 were Euclids with four-wheel tractors. Push tractors included a Euclid TC-12, four Allis-Chalmers HD-20's and HD-21's, and Caterpillar D8's and a D9. Three Caterpillar D8 tractors pulling No. 80 scrapers rounded out the fleet.

Groves found that the Caterpillar DW21 scrapers with their 2-wheel tractors worked best in the sand, and these rigs, together with the D9 and D8 push-tractors, were kept in the ditch that supplied the select subbase material. Whenever weather and soil conditions permitted, the "Euc" scrapers worked with the gumbo.

This gumbo material was slow and difficult to load, piling up in the scrapers in chunks that began to overflow the bowls long before the load was really full. It was equally difficult to dump and spread the material, as the chunks did not break up with handling. And, since the gumbo usually contained moisture in excess of the optimum amount for compaction, it had to be spread out on the fills and allowed to dry before the compaction equipment could start work.

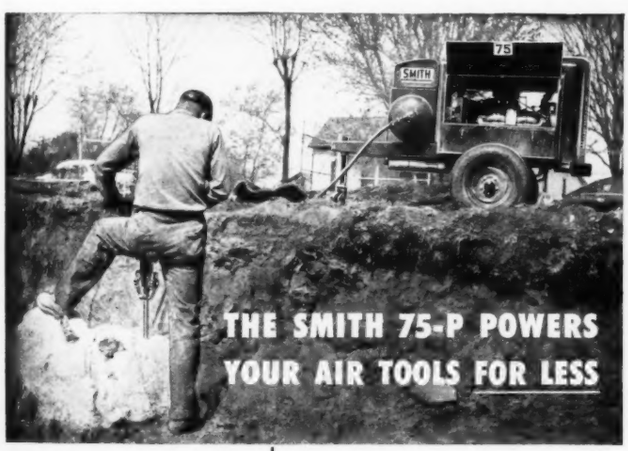
When it rained, and sometimes for several days afterward, the gumbo became a sea of mud that made it impossible for equipment to operate with any efficiency. Whenever this happened, the "Euc" scrapers and their push-tractors moved into the sandy areas and joined the DW21 spread in hauling the sand subbase into place.

One spread of the Euclid scrapers started the drainage ditch leading from the field to the Turtle River, but after getting down a few feet, the scrapers found they were continually getting bogged down in the soft, wet subgrade. The ditch was completed by a Lima Model 604 dragline using a Hendrix 2-yard bucket. Some of this ditch excavation was loaded into the Euclid scrapers and hauled to the waste areas.

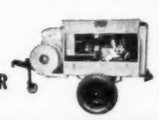
Compaction

The sandy select subbase material was spread in thin layers by the scrapers. If necessary, it was bladed out by one of four Caterpillar No. 12 motor graders on the job. Bros and Ferguson 50-ton rubber-tire compactors pulled by Caterpillar D8 tractors easily compacted the thin courses to the required 90 per cent Modified Proctor density.

Compacting the gumbo was a different problem. After the scrapers



SMITH 120-P COMPRESSOR



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For more facts, use coupon, or Request Card at page 18 and circle No. 300

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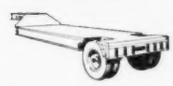
MODEL TT

Heavy-duty tilt trailer. Capacities 6, 8 and 10 tons.

MODEL KS-F



Single axle flat bed semi, capacities 10 through 20 tons. Drop deck or flat deck.

MODEL SP

Jack over axle models. Capacities 11 through 25 tons.

MODEL GTX

Triple axle, 6 dual wheels. Capacities 25 through 45 tons. Flat or drop deck.

MODEL GXTT

Gooseneck type, tandem axle tilt-trailer. Capacities 14 through 22 tons.

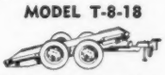
MODEL GPX

Tandem axle. Capacities 16 through 35 tons. Drop deck or flat deck.

MODEL XTT

Tandem axle tilt trailer (tow type), capacities 13 through 20 tons.

MODEL T-8-18



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Heavy-duty tandem axle, spring mounted platform or float.

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Dual axle drop bed semi, capacities 15 through 30 tons. Drop deck or flat deck.

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Multiple axle drop bed semi, capacities 35 through 75 tons. Drop deck or flat deck.

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Single or tandem axle models. Standard capacities 8 through 15 yards.

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For more facts, use Request Card at page 18 and circle No. 301

(Continued from preceding page)

An old barn not in the way of early construction makes a good four-stall shop-and-parts warehouse for S. J. Groves. The contractor bid in the barn when the old buildings on the site were auctioned.

had spread the material on the fills, it was allowed to dry down to about optimum moisture content. Then it was worked with scarifiers and sheepsfoot rollers until it was pulverized and compacted. A very effective scarifier was a shop-made bar attached to the rear of a Caterpillar D8 tractor and fitted with 13 motor grader scarifier teeth arranged in a double row. This tractor also carried a dozer, enabling the rig to handle even the worst of the chunks and piles of gumbo. Most of the compaction of this material was applied by the LeTourneau-Westinghouse Model 120 sheepsfoot rollers pulled by Caterpillar D8 tractors.

Install underdrains

The installation of 43,500 linear feet of 6-inch perforated concrete drains along both sides of the runway and taxiway was one of the grading contractor's big headaches. These drains had to be laid about a foot below subgrade level just outside the edge of the runway. They were laid in a bed of 18-inch-wide filter material that had to be carried up the 6 feet of the runway depth to the surface.

On one side of this thin vertical section was compacted random shoulder material. On the other side were the several courses of runway subbase and base. The problem was to get compaction on both sides and still leave the filter material open so that water could find its way down to the drain.

When the runway excavation had been brought to subgrade, one of the Caterpillar No. 12 motor graders cut out the foot-deep trench for the drain. Some handwork was required to complete this trench ahead of the pipe-laying operation. A bed of the filter gravel was then placed in the bottom of the trench and the pipe laid on this bed. About a foot of the filter gravel was placed over the pipe.

Construction of the runway courses and the shoulder then proceeded, while the drain was disregarded. In this way, it was possible to build the two up together and compact both materials right out to the edges. There was no sharp line of demarcation between runway and shoulder since the two types of material intermingled.

When both runway and shoulder had been built up to grade, a trencher cut a narrow trench straight down to the filter material over the pipe, and this trench was immediately backfilled with filter gravel.

Although the job of laying and covering the concrete drain pipe seemed slow, and was a constant source of worry for the contractor, the crew of 20 men actually placed the pipe at a rate of from 800 to 1,000 linear feet per 10-hour day.

The 40,000 cubic yards of filter gravel and 480,000 cubic yards of 1-inch crushed gravel base material were obtained from pits that were operating in glacial deposits within four or five miles of the site. Trucked to the job, these materials were spread and compacted by some of the equipment used to place the select subbase.

Water for the base and subbase materials was obtained from the nearby Turtle River. A Barnes 4-inch pump first raised the water from the river to a 7,500-gallon elevated storage tank. A 6-inch discharge line from the storage tank was fitted with a quick-opening valve to speed the loading of the tank trucks that hauled to the runway.

The concrete paving was sublet to Central States Construction Co., Willmar, Minn. Since there were no suitable concrete aggregates in the local pits, the aggregates were shipped in

The Times

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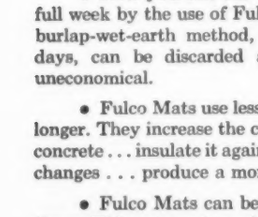
Big Help for Contractors!

• Now you can cut concrete curing time a full week by the use of Fulco Mats. The old wet-burlap-wet-earth method, which took a full 10 days, can be discarded as unsatisfactory and uneconomical.

• Fulco Mats use less water and stay wetter longer. They increase the compressive strength of concrete . . . insulate it against sudden temperature changes . . . produce a more uniform job.

• Fulco Mats can be easily reused up to 75 times. This cuts cost-per-job to the lowest figure, makes Fulco® Mats pay for themselves.



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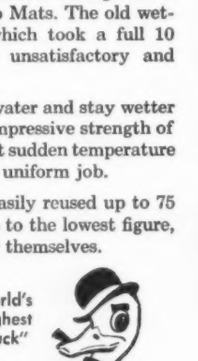

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. . . when some stuck together part threatens production. They won't take a chance on breaking the part with brute strength.

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As one customer said, "Kroil loosens everything from an embalmer's needle to a bulldozer."

Another wrote, "Before trying Kroil on heat treat trolleys, we broke off every nut . . . since then we have not lost one."

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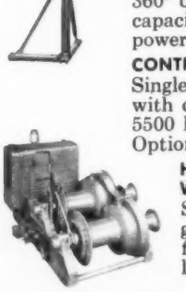
SEE Sasgen FOR CONTRACTORS' DERRICKS • HOISTS • WINCHES



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• Simple in design, easily maintained.

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by rail from Detroit Lakes, Minn. Cement and aggregates for the 142,000 cubic yards of concrete pavement constituted a substantial part of the material delivered on the 3.5-mile spur built into the site for this job by the Northern Pacific Railroad.

Equipment maintenance

When Groves first began moving in, the existing buildings on the site were being sold on bids for removal ahead of the construction operations, and Groves bid in a barn that was not in the way of early construction operations. Workmen removed the hay loft, opened up one side, poured a new concrete floor, and transformed the old barn into a good four-stall field shop. Another part of the barn was converted to a tool and parts room, and a machine shed was made into an oil house.

The shop was equipped with a Malsbary steam cleaner for the equipment, a Lincoln welding generator, and other tools and equipment needed for the complete maintenance and overhaul of the big fleet of earthmoving rigs on the job.

Daily servicing of every machine in the field was done by a crew of three men on each shift using a well-equipped Graco lube rig mounted on a Ford F-600 truck. Six hose reels fed by Graco pumps were used to handle three types of grease, two grades of motor oil, and air. A Westinghouse compressor driven by a Wisconsin engine supplied air, and a Kohler generator provided lights for night operation. Servicing was done with Standard fuel and Standard and D-A lubricants.

The contractor set up field offices on a rise near the shop building. Two office trailers were set about 20 feet apart, and a room built between them served as the contractor's office. This 16×20-foot central room consisted of front and rear knotty pine and sheetrock walls, an asphalt tile floor, and a roof. The points of contact with the two trailers were carefully calked to seal them tight.

This room not only provided an additional work space, but also a place where visitors could be received and where business could be transacted over a counter without disturbing the men at work in the trailer offices.

One of these was a 28-foot International office trailer, the other was a 41-foot Florence. Other International trailers provided an engineers' office and a field laboratory. The office setup was supplied with running water from a drilled well and it had a septic tank for sewage disposal.

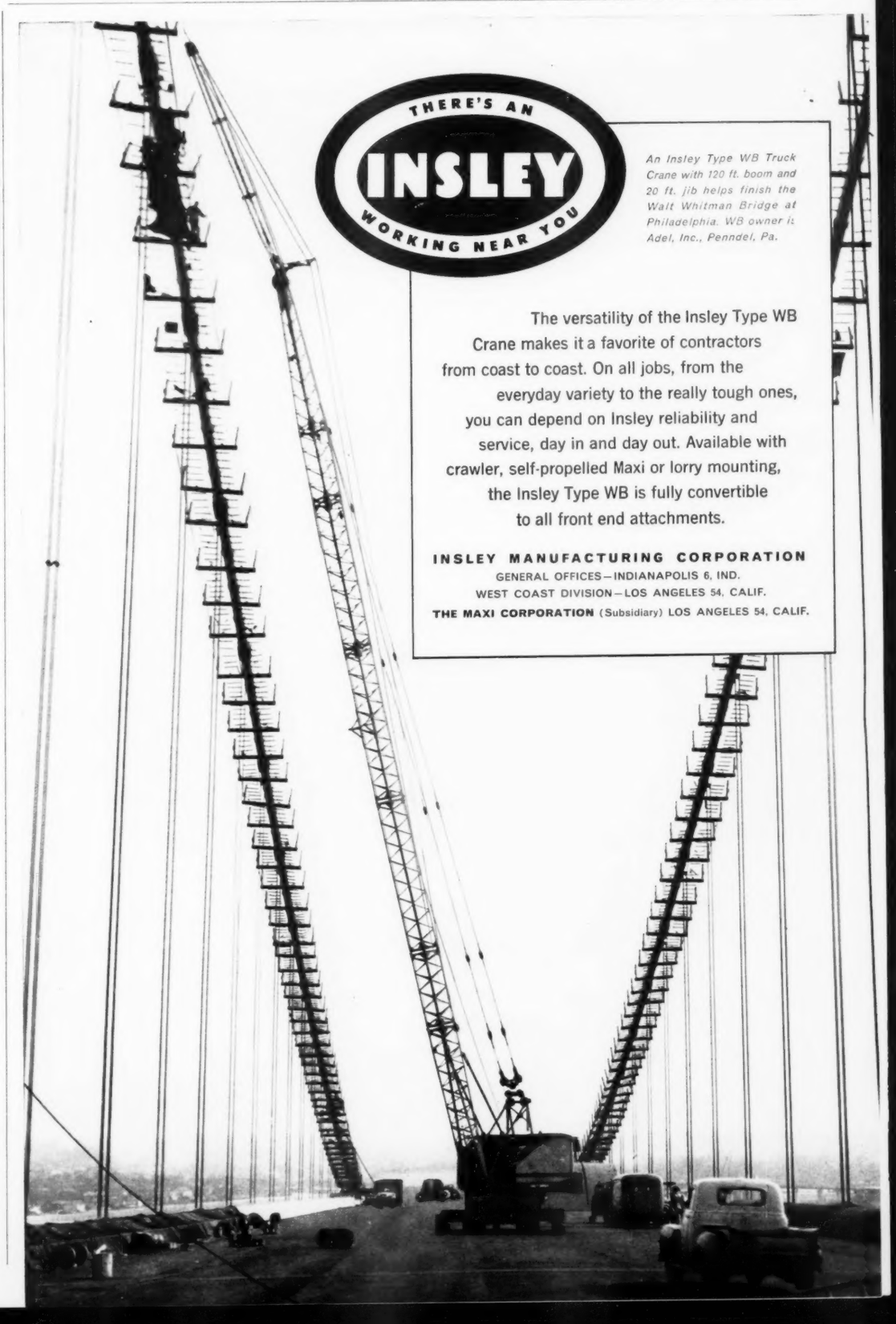
In addition to Groves' contract for the grading and paving of the runway, taxiway, and aprons, additional contracts were let for the other facilities at the Air Force Base. A joint venture of Lovering Construction Co., St. Paul, Minn., and Otto Eickhof & Sons, Inc., Crookston Minn., is building dormitories and mess halls. J. F. White Engineering Corp., Englewood, Colo., built the heating plant and installed the high-temperature hot-water heating system. Fred R. Combo, Minneapolis, Minn., had the contract for construction of the operational buildings and hangar.

A 400,000-gallon elevated water tank was built by Chicago Bridge & Iron Co. A $3 million contract for base roads and utilities was taken by a joint venture of several North Dakota contractors, including McCormick-Erling Co., Fargo; Paul Kemper of Minot; Delzer Construction Co., Bismarck; and Tri-States Excavating Co., Fargo. Airfield lighting was installed by Jayhawk Electrical Contractors, Topeka, Kans.

Personnel

On the grading and base work, Groves employed about 200 men on two 10-hour shifts, six days a week. Since much of the work was done at night under artificial illumination, a number of portable plants were used. The contractor also set up a pole line in an area where there was much work to be done. Each pole carried six 1,500-watt floodlights fed by power lines strung between the poles and supplied from commercial power lines.

The supervisory staff for S. J. Groves & Sons Co. was headed by project manager Judd Mowry, with H. H. Westphal as assistant project manager. Others on the staff were Frank Tomsyck, chief engineer; A. S. Anderson, office manager; Kim Smith, day grading superintendent; Ray Mills, night grading superintendent; and Pete Cauchy, master mechanic. Herb Johnson was paving superin-



An Insley Type WB Truck Crane with 120 ft. boom and 20 ft. jib helps finish the Walt Whitman Bridge at Philadelphia. WB owner is Adel, Inc., Penndel, Pa.

The versatility of the Insley Type WB Crane makes it a favorite of contractors from coast to coast. On all jobs, from the everyday variety to the really tough ones, you can depend on Insley reliability and service, day in and day out. Available with crawler, self-propelled Maxi or lorry mounting, the Insley Type WB is fully convertible to all front end attachments.

INSLEY MANUFACTURING CORPORATION
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For more facts, circle No. 305→

tendent for Central States Contracting Co.

These and others on the staff made good use of a General Electric VHF mobile radio system to coordinate the several phases of the work. The system included base stations at the office and shop and 12 mobile units in the cars and pickups of supervisory personnel.

The resident engineer on the project for the Omaha District of the Corps of Engineers was Captain C. R. Roberts. The assistant resident engineer was E. C. Wolters. In direct charge of the building operations was John A. Brummitt, while John R. Richardson supervised the work on roads, runways, and similar construction. THE END

The mix for waterproofing the bridge deck of the Springfield-Sandusky interchange is dumped into the discharge pan and loaded in buckets to be carried up to the bridge deck. The Littleford Model 700 Trail-O-Patcher kept the mix at a steady temperature of 375 degrees Fahrenheit.

Waterproofing bridge decks goes on despite rain

Bridge span jobs do not wait for fine days, it was found by Wander & Mason, Worthington, Ohio, contractors who were working in rainy weather last spring on the Springfield-Sandusky interchange on the border of Columbus, Ohio. At this time, the contractor had finished installing two 31-foot 4-inch-wide railroad spans—one of which was 58 feet long, and the other 78 feet long—and he was facing the job of waterproofing the bridge deck.

This particular job called for the bridge decks to be covered with a ½-inch asphalt-mastic leveling course followed with a membrane waterproofing, a section of 4×4 No. 10 welded wire fabric, and then about 4 inches more of asphalt mastic graded and leveled for drainage. Instead of mixing and heating the asphalt mastic by hand in steel pans as was called for, the contractor used the Littleford Model 700 Trail-O-Patcher.

The contractor, following specifications of the American Railway Engineering Association, used pre-dried aggregate, which was dumped in the unit's pugmill and heated for about four minutes. Asphalt was then added and kept at a temperature of 360 degrees F. After about 30 seconds' mixing time granite dust filler was added. This filler was not carried up the stack because of the asphalt already being added. The resulting mix for the deck was kept at a steady temperature of 375 degrees F.

BPR forms division to study projects

The Bureau of Public Roads has formed a new Project Examination Division to make spot audits of both the Bureau of Public Roads and state operations in the federal-aid highway program. The division will check all operations pertaining to construction, engineering, right-of-way acquisition, and all other aspects of the program.

In operation of the BPR and its offices, the new division will ascertain if the operations are in compliance with existing procedures and practices, identify and report on deficiencies, and make recommendations for correcting deficiencies, changes in procedures, and improving operations.

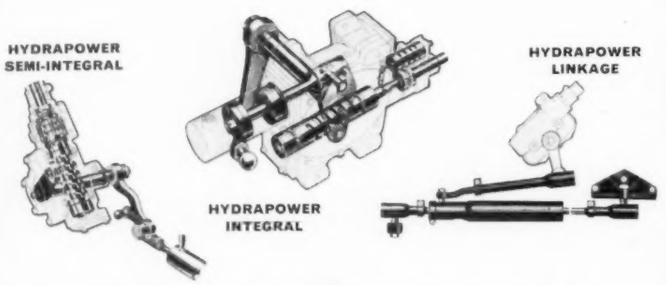
Frank Alexander, chief accountant for the BPR, will direct the work of the division.

Courtright joins Joy

John P. Courtright has joined the Joy Mfg. Co., Pittsburgh, Pa., as a consultant on metal mining, quarrying, strip mining, and construction problems.

He is a member of the American Institute of Mining, Metallurgical and Petroleum Engineers, and has served as the mining industry consultant to the Mining Machinery Division of the U. S. Department of Commerce's Business and Defense Services Administration.

POWER STEERING



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Ross engineers are prepared to answer this question in terms of *one* responsibility from design to completed unit—because Ross makes *all three* types—in dependable, effortless, economical *Ross Hydrapower.*

Ross invites discussion of *any* steering problem—manual or power.

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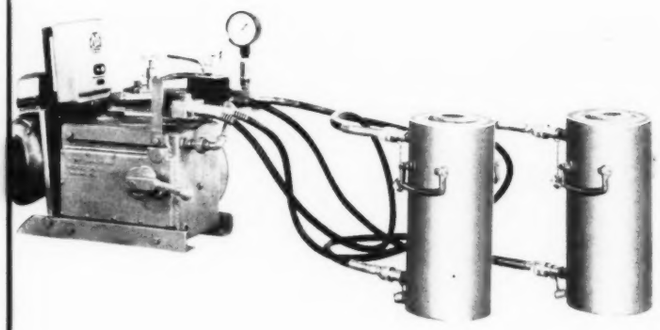
PRODUCT PARADE

For further information on any of the products described in the following section, circle the designated number on the Request Card at page 18.



Hydraulic jacks eliminate eccentric loading

Simplex hydraulic pullers, designed to eliminate eccentric loading through a center-hole construction that permits power to be applied in direct-line pull through a ram, are announced by Templeton, Kenly & Co.

Two or more pullers may be mounted to handle any installation for the production of double-T, slab, or channel members in permanent beds or at the job site. Standard rams with 10-inch stroke are available in 60 and 100-ton models, and with 22-inch stroke in a 100-ton model; special units in capacities up to 600 tons.

For further information write to Templeton, Kenly & Co., Dept. C&E, 2525 Gardner Road, Broadview, Ill., or use the Request Card at page 18. Circle No. 174.

Screed strikes off, finishes in one pass

A new Twin-Beam vibrating screed, said to be designed especially for the precast prestressed field, is available from the Stow Mfg. Co.

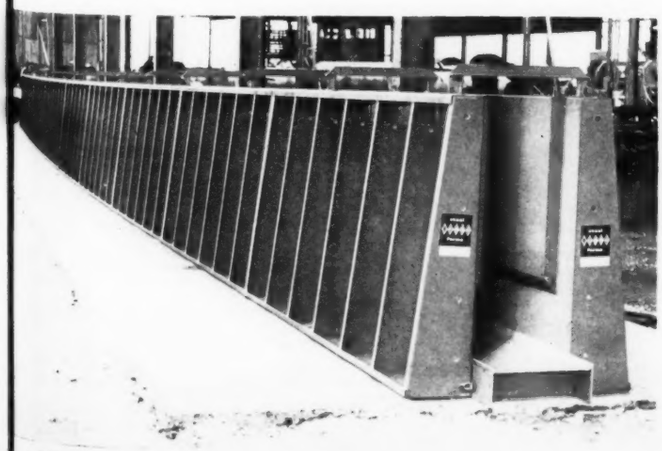
According to the manufacturer, using this screed is like making two passes at once: the vibrating head transmits vibration evenly to the two beams so that as the screed is pushed along the first beam strikes off the concrete and the second beam gives it a final finish. Any air bubbles left by the first beam are eliminated by the passing of the second beam. The result, the manufacturer reports, is a thoroughly vibrated, smooth slab.

The Stow Twin-Beam screed is available with either a 1-hp electric motor or a 2½-hp gasoline engine, powering a 2½-inch vibrator head which operates at a speed of about 5,000 vibrations per minute.

The motor or engine, as well as the handles on either end of the unit, are insulated from the screed's vibration by rubber mounts, thus eliminating strain on the workmen. The screed can be pushed along by just two men.

The steel-shod beams are available in lengths up to 6 feet.

For further information write to the Stow Mfg. Co., Dept. C&E, 40 Shear St., Binghamton, N. Y., or use the Request Card at page 18. Circle No. 175.



Prestress forms designed for flexibility

Steel forms for practically all types of prestressed sections currently in use are offered by the Plant City Welding & Tank Co. These include forms for bridge girders, flat slabs, square and octagonal piling, double tees, sheet piling, and others.

The use of liners, inserts, and filler channels in the basic sections is said to permit the production of a wide range of sizes from a single set of forms. The forms are available in 10 and 30-foot lengths which can be bolted together in multiples to provide any desired length.

A feature of the Watco forms is the solid steel chamfer strips said to greatly increase the rigidity and strength of the sections, as well as provide more precise corners than can usually be obtained in bent plates.

Each form is assembled and checked for perfect alignment at the factory.

For further information write to the Plant City Welding & Tank Co., Concrete Form Div., Dept. C&E, P. O. Box 1308, Plant City, Fla., or use the Request Card at page 18. Circle No. 134.

Photo shows application of Aeroflex tubing for bond prevention over prestress strands. Desired stress distribution pattern in beam is obtained by partial covering of several strand sections. Aeroflex tubes can be seen in foreground.

Tube prevents bonding in prestressed units

A new plastic tubing, to prevent bond in pre-tensioned prestressed concrete structures where a number of parallel strands run through the structure and are anchored at both ends, is announced by the Anchor Plastics Co.

Called Aeroflex, the tubing is an overlapping tube with the overlap length about one half the circumference. According to the manufacturer, it is easily and speedily applied over the strands by opening it and walking along the strand while pushing the opened tube against the wire. The flexibility of the tubing makes it self-enclosing around the strand, with no taping or tying required, preventing the ingress of concrete and water.

For further information write to the Anchor Plastics Co., Dept. C&E, 36–36 36th St., Long Island City 6, N. Y., or use the Request Card at page 18. Circle No. 129.

Manufacturing setup for prestress work

Abbreviated manufacturing facilities for the potential prestresser are announced by the Prestressed Equipment Co.

Units available enable the producer to manufacture by screeding in the form either an 8 or 12-inch-deep joist, as well as standard double-tee members.

According to the company, the 12-inch member will provide for spans up to 26 feet with a safe, superimposed load of up to 220 pounds per foot, and the same joist for spans to 30 feet would qualify for a safe, superimposed load of 160 pounds per foot.

The equipment for both joists and double tees includes the firm's standard Tru-Form, 120 feet long. The form consists of four 30-foot sections of all-steel casting forms, with all casting surface form welds ground flush and smooth.

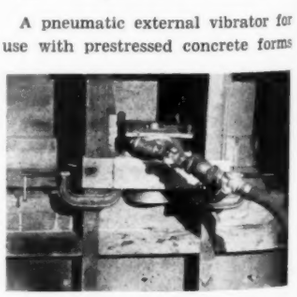
In the case of joists, forms may be ganged or the line extended to increase production.

Facilities for joists and double tees include the jack, a matching pump of 50-ton minimum capacity, ram, hoses, and couplings.

For further information write to the Prestressed Equipment Co., Dept. C&E, P. O. Box 1053, Lakeland, Fla., or use the Request Card at page 18. Circle No. 130.

Vibrator for use in prestress units

A pneumatic external vibrator for use with prestressed concrete forms



and screeds is available from McCaron Bros.

Designated the Model M-20 Jet Shaker, the vibrator is propelled by a jet stream of air on a turbine rotor. Two bearings are its only moving

Make your dragline "BIGGER" with a new-design Bucyrus-Erie bucket

This new-design, 2½-yd. Bucyrus-Erie bucket is swung by a 38-B dragline working on extension of a four-lane highway near Platteville, Ohio.

You can add to the efficiency of your dragline — in effect make it *bigger* in performance by swinging an all-new Bucyrus-Erie bucket. New design concepts, plus use of a special alloy, give these buckets extra output possibilities. Weight is balanced so that teeth and thin "slicing-action" lip penetrate rapidly for fast, full loading. Material flows smoothly into the tapered basket. Bucket carries with a minimum of bobbing and spilling — the result of proper flaring and balance. Dumping is clean and fast because of smooth inside design and high arch.

BECOLOY, the special alloy from which Bucyrus-Erie buckets are made, is extra tough to resist impact, shock and wear so that thinner sections can be used for building lightweight buckets. It can be cut with an acetylene torch and welded rapidly with only moderate pre-heat for easy field maintenance.

There are Bucyrus-Erie buckets in a wide range of sizes — for light, medium or heavy duty — with solid or perforated baskets. Your Bucyrus-Erie distributor will be glad to help you choose the one to get the best performance from your dragline.

BUCYRUS ERIE

A Familiar Sign at Scenes of Progress

BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WISCONSIN

36R57

For more facts, use Request Card at page 18 and circle No. 307

parts, the company reports.

According to the manufacturer, the unit will deliver up to eight thousand 2,600-pound blows per minute. Its air consumption is 25 to 60 cfpm at 100 psig air pressure.

A turbine delivering 12,000 vibrations per minute is also available.

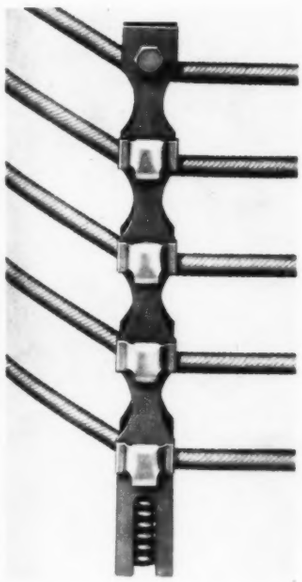
Other applications of the Jet Shaker include use on bins, hoppers, concrete pipe forms, vibratory earth compactors, tunnel forms, bridge piers, and concrete piling.

Write to McCaron Bros., Dept. C&E, P. O. Box 336, Depot and El Monte Sts., Baldwin Park, Calif., or use the Request Card at page 18. Circle No. 15.

Restrains cables in prestress beams

A specially designed Hold-Down for restraining wires and cables in prestressed beams and girders is announced by Superior Concrete Accessories, Inc.

These Hold-Downs restrain and hold the strands in the approximate



path or position of a catenary curve for maximum efficiency of the overall design, and are available in one to seven strands as required.

The unit is held in position by ¾-inch high-tensile coil bolt. Safe load on a 7-strand Hold-Down is said to be approximately 14,700 pounds.

For further information write to Superior Concrete Accessories, Inc., Dept. C&E, 9301 King St., Franklin Park, Ill., or use the Request Card at page 18. Circle No. 90.

Compression tester ideal for prestress

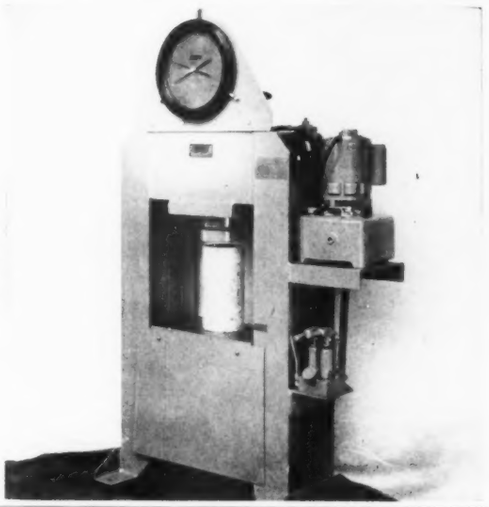
Its all new Model QC-125-LD compression tester, designed especially for testing the modern high-strength concretes in the prestressing field, is announced by Forney, Inc.

Equipped with a constant-flow pump which is factory adjusted to load at between 20 to 50 psi per second, and a two-stage manual pump for fast preloading, the unit is said to offer extreme uniformity of loading within the range of ASTM and AASHO specifications.

The 12-inch-diameter gage is mounted on springs so that the heavy shock resulting from breaking specimens is completely absorbed. The dial is calibrated in pounds 0 to 250,000 with 500-pound sub-graduations.

The spherically seated upper platen assembly is in accordance with ASTM and AASHO specifications.

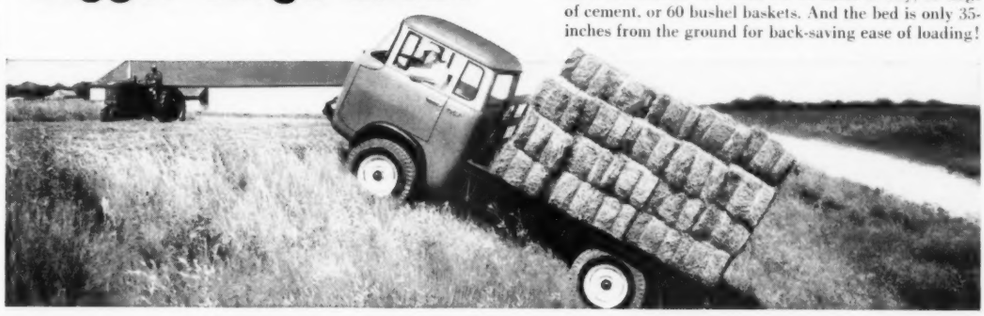
For further information write to Forney's, Inc., Tester Div., Dept. C&E, P. O. Box 310, New Castle, Pa., or use the Request Card at page 18. Circle No. 158.



Designed for testing concrete in the prestressed field, this Forney compression tester is equipped with a constant-flow pump.

Bigger cargo area!

Another new and bigger Forward Control 'Jeep' Truck—the FC-170—puts a big 9-foot platform stake body on a wheelbase only 103½-inches long. This 7,000-pound GVW workhorse has room for 49 bales of hay, 35 bags of cement, or 60 bushel baskets. And the bed is only 35-inches from the ground for back-saving ease of loading!



"Go-anywhere" action!

The new 'Jeep' FC-170 Truck sets a new standard for "big-load" maneuverability. It delivers payloads of up to 3500-pounds to areas ordinary vehicles can't reach. The spacious Safety-View cab puts you in a "Forward Control" position—lets you maneuver on or off the road with greater command of any driving situation!

Tough-job traction!

The extra traction of FC-170 4-wheel drive, and its wide 63-inch tread, take you "almost anywhere" with ground-gripping stability. It shifts easily into conventional 2-wheel drive for highway travel. The high-torque Hurricane 6-226 engine delivers real working power at low cost. It's ready for your bigger, tougher jobs!

New 'Jeep' 4-Wheel-Drive / Forward Control FC-170

Willys... world's largest manufacturers of 4-Wheel-Drive vehicles

...other members of the famous 'Jeep' family:

Forward Control 'Jeep' FC-150 | Universal 'Jeep' | 'Jeep' Utility Wagon

See 'Jeep' vehicles at your Willys dealer

For more facts, use Request Card at page 18 and circle No. 308

New cutting tool for prestress wire

A portable cutting tool capable of cutting $\frac{3}{8}$-inch prestressing wire in one second or less is announced by the Manco Mfg. Co.

The tool is designed for the dimensional limitations of the form developed by the Leap Concrete Co. of Florida. The application is to cut the strands which are spaced one on top of the other on approximately 3-inch centers, the lowest of which is approximately $1\frac{1}{4}$-inch from either side and bottom, and perhaps 36 inches from the top.

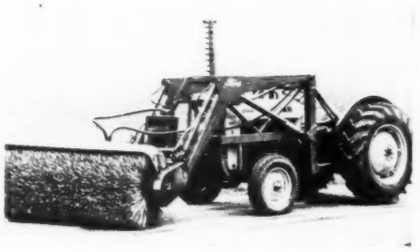
It is the company's opinion that in being able to cut all wires in this particular form, the new machine will have universal application in the field.

For further information write to the Manco Mfg. Co., Dept. C&E, Bradley, Ill., or use the Request Card at page 18. Circle No. 133.

New two-way sweeper for tractor loaders

A two-way hydraulic sweeper which can be quickly mounted on most popular-make tractor loaders in place of the bucket has been introduced by the M-B Corp.

Said to be ideal for use by contractors, highway departments, and municipalities, the new sweeper model offers a fast and economical means of adapting loader-equipped tractors to many sweeping jobs such as clearing debris, dirt, leaves, and snow.



The M-B sweeper can be mounted on most tractor loaders in place of the bucket.

Sweeping jobs are said to be further speeded up with this type of unit because of the two-way angling broom which provides for a brush to be angled 30 degrees either to the right or left. Swing arms keep the sweeping path centered ahead of the tractor regardless of the broom angle, further simplifying the job by keeping the tractor traveling in the clean-swept path. For traveling, the sweeper is simply lifted up by the loader arms.

To insure good sweeping, a heavy-duty hydraulic motor is used. Since hydraulic motors of the heavy-duty type demand hydraulic fluid at a pressure and volume different from most tractor loaders, the sweeper is furnished complete with its own hydraulic system.

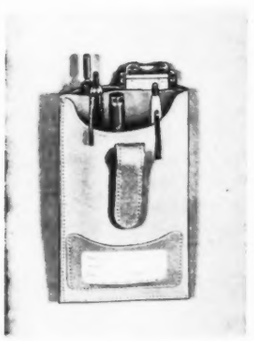
The new M-B sweeper is furnished with a 6-foot-long brush which sweeps a 5-foot path when angled in normal sweeping position. Adjustable spring-loaded ground pressure control keeps the broom in proper contact with the surface for thorough sweeping. Heavy ball bearings are used in the brush mounting, and the brush hood is removable for snow sweeping.

For further information write to M-B Corp., Dept. C&E, 1635 Wisconsin Ave., New Holstein, Wis., or use the Request Card at page 18. Circle No. 68.

Leather pocket case for slide rule, pencils

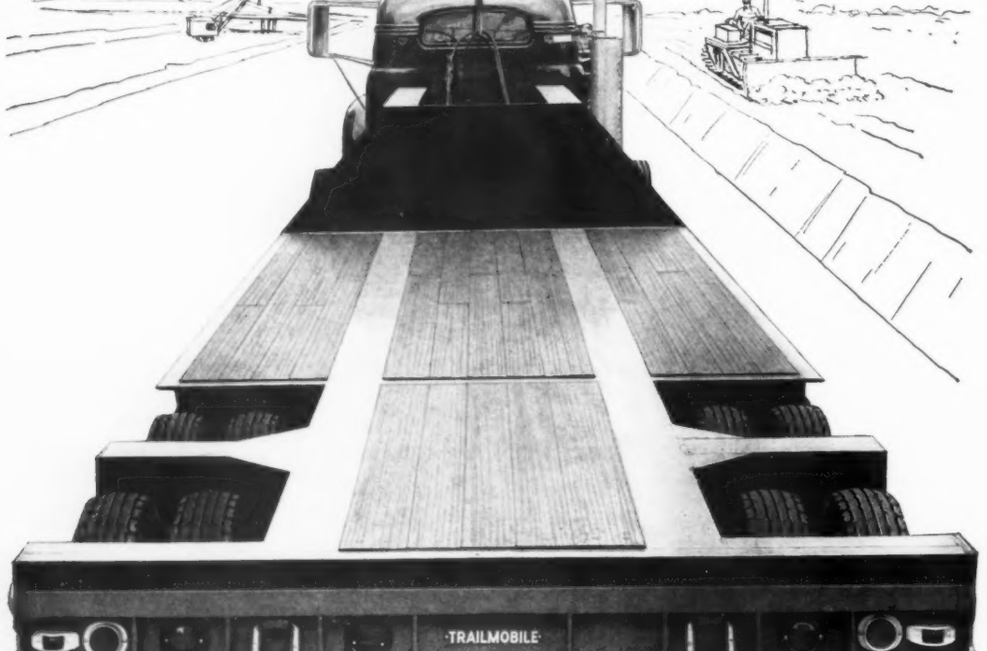
A handy pocket case, designed to hold a 6-inch slide rule, plastic rule, and up to 6 pens and pencils, is offered by Bauer-Lee & Co.

Divided into three compartments, the case is made of saddle leather.



with a leather-covered spring steel safety clip to secure it firmly to the pocket. It also features an identification card in an outside patch pocket. The case measures $3\frac{1}{2} \times 5\frac{3}{4}$ inches, to fit coat, jacket, or shirt pocket.

For further information write to Bauer-Lee & Co., Dept. C&E, 136 E. Montecito Ave., Sierra Madre, Calif., or use the Request Card at page 18. Circle No. 8.



How much weight will a Trailmobile low bed carry?

☐ 20,000 lbs. ☐ 40,000 lbs. ☐ 60,000 lbs. ☐ 80,000 lbs. ☐ 150,000 lbs.

Regardless of which weight you checked, you're right—because Trailmobile builds a low bed trailer for payloads in every weight class. Five versatile models feature massive, sturdy frames that are built to strength standards far exceeding normal requirements.

All units are available on convenient financing and factory service facilities are offered in 53 cities from coast to coast.

TRAILMOBILE INC.

Cincinnati 9, Ohio, Berkeley 10, Calif., Springfield, Mo., Longview, Texas
Sales and Service from Coast to Coast

For complete information check your nearest Trailmobile sales office or use the coupon.

TRAILMOBILE INC. • 31ST & ROBERTSON • CINCINNATI 9, O.
Please send me complete information on Trailmobile Low Bed Trailers.
Name _____
Company _____
Street _____
City _____ State _____

For more facts, use coupon, or Request Card at page 18 and circle No. 309

The Allis-Chalmers Model TS-160 hydraulic motor scraper has a 7-yard struck, 9½-yard heaped capacity, for a 12-ton payload.

Scraper makes full turn in less than 25 feet

Its new Model TS-160 hydraulic motor scraper is announced by the Allis-Chalmers Mfg. Co. The new unit, with a 7-cubic-yard struck and 9½-cubic-yard heaped capacity, carries a 12-ton payload.

The TS-160 has an Allis-Chalmers 6-cylinder, 516-cubic-inch displacement, supercharged diesel engine rated at 155 horsepower at 2,200 rpm. It has a 5-speed constant-mesh transmission with forward speeds ranging from 3.1 to 25.4 mph; reverse speeds to 3.1 mph.

Two-speed hydraulic steering with 90-degree steer each way is a feature. The tractor can swing into a right-angle turn with only a 1/6 turn of the steering wheel. A complete nonstop turn can be made in 24 feet 8½ inches.

The low, wide-bowl design features a curved one-piece steel bowl bottom. This curvature is said to lessen loading resistance and create a live material action that results in faster heaped loads.

The bowl has an 83½-inch apron opening and a 97½-inch width of cut. The depth of cut ranges from zero to 24¾ inches, and the depth of spread from zero to 16⅝ inches. Height of the bowl sides is 44 inches.

For further information write to the Allis-Chalmers Mfg. Co., Tractor Group, Dept. C&E, Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 29.

Improved truck crane now lifts to 40 tons

New engineering changes and increased lifting capacity for its 43-M truck crane are announced by the Marion Power Shovel Co.

Formerly a 35-ton machine, the rubber-mounted unit now has a rated lifting capacity of 40 tons at an operating radius of 12 feet.

Among the new engineering features is an improvement of Marion's power-up power-down boom hoist, which lowers the boom at one half the raising speed at any given engine speed, and allows the operator to spot the load safely and accurately. The boom hoist is fully independent of other machine motions.

The gantry has been re-designed to improve the lead on the cable to straight line reeving and obtain smooth wrapping of cable on the drum.

Carrier outriggers are on rollers for fast and easy setting. Lightweight aluminum floats have been added as standard equipment.

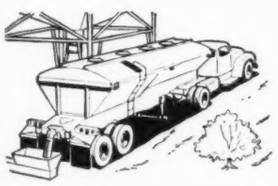
The 43-M can use up to a 100-foot boom. For high-lift crane service, 15 and 30-foot boom jibs are available. Maximum boom and jib length is 130 feet.

Standard equipment for crane service includes a cable-type safety boom stop with an adjustable air-control switch to prevent raising the boom beyond safe limits.

The 43-M uses a custom-built carrier powered by a Waukesha 145 GKB gasoline engine delivering 214 hp at 2,100 rpm. It has 6 speeds forward with a maximum speed of 31.9 mph. Diesel drive is optional. The truck chassis is 25 feet 7 inches long.

For further information write to the Marion Power Shovel Co., Dept. C&E, 2 Cheney Ave., Marion, Ohio, or use the Request Card at page 18. Circle No. 123.

There's a Trailmobile trailer for every construction need

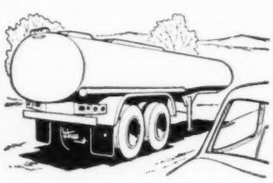


TRAILMOBILE CEMENT BULKERS

. . . transport large amounts of bulk cement to mixing plants at the job site. Both steel and aluminum types offer exclusive step-down design with twin screw discharge.

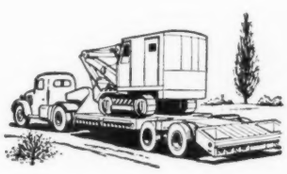
TRAILMOBILE HYDRAULIC DUMPS

. . . provide big capacity in a dump-type trailer for hauling and unloading sand and gravel. Unusually rugged construction guards against costly out-of-service time.



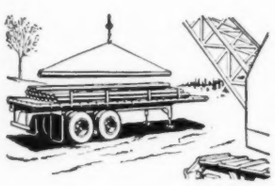
TRAILMOBILE TANK TRAILERS

. . . are widely used for hauling hot asphalt, road oils, and the great volume of water required at the site. Most units carry a unique guarantee against tank leakage.



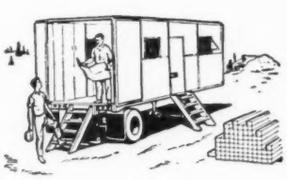
TRAILMOBILE LOW BEDS

. . . are used to deliver heavy road building equipment to the job area. Steel shovels, bull dozers and other large tractor-treaded units can be easily transported on these powerfully built trailers.



TRAILMOBILE PLATFORM TRAILERS

. . . are used for carrying lumber, cement forms, drainage tile, straw bales and sundry light equipment. "Sideless feature" permits simpler, faster loading and unloading.



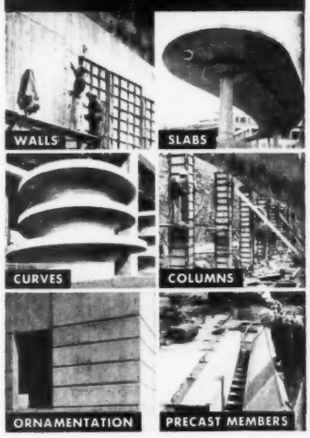
TRAILMOBILE FREIGHT VANS

. . . combine weather protection and mobility for hauling general supplies. Low cost used vans provide ideal job site offices, tool shops or storage facilities.

TRAILMOBILE INC.

Cincinnati 9, Ohio, Berkeley 10, Calif., Springfield, Mo., Longview, Texas
Sales and Service from Coast to Coast
For more facts, use Request Card at page 18 and circle No. 310

BEST for ANY JOB!



FOR DESIGN ADAPTABILITY, no other material compares with fir plywood. Monolithic surfaces, curves, special effects are easily achieved with fir plywood. Large panels are easy to cut, fit and fasten. Plywood forms smoother concrete, cuts application, finishing time. Interior PlyForm® grade gives up to 10-12 re-uses; Exterior PlyForm® 25 or more; overlaid plywood about 200!

specify DFPA TESTED QUALITY

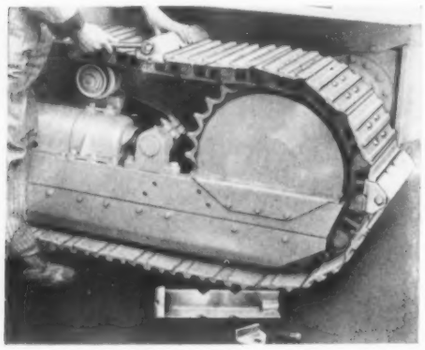
Fir Plywood
CONCRETE FORMS

FREE: New portfolio to help you design and use fir plywood forms. Contains complete specification, construction and design data.

DOUGLAS FIR PLYWOOD ASSOCIATION
Dept. 138, Tacoma 2, Wash.
Please send new Fir Plywood Concrete Form Portfolio. (Offer good USA only)

Name .....
Firm .....
Address .....
City ..... Zone ..... State .....

For more facts, use coupon or circle No. 311



Detachable grousers, available for the 1½ and 2-cubic-yard Case TerraTrac crawler-mounted tractor shovels, are said to increase digging ability up to 30 per cent in mud or sand.

Midget crawler features hydraulic bucket dump

Mead Specialties Co., manufacturer of the Speedcat midget tractor, now offers a hydraulic bucket dump as optional equipment on its small crawler.

The bucket can be held rigidly at any desired angle with the ground, and rotated while in motion to dig and scoop up the largest possible load. With the bucket lip rolled up, larger loads can be carried: even wet or liquid material can be retained. Loads can be scattered if desired, by dumping a little at a time while the tractor moves forward.

According to the company, these features lend themselves readily to various phases of concrete construction. Dry material can be delivered to the mixer, and wet cement carried away. And the Speedcat will crawl over places impossible for small wheel tractors or even wheelbarrows, the manufacturer states.

For further information write to Mead Specialties Co., Dept. C&E, Dept. SC-80, 4114 N. Knox Ave., Chicago 41, Ill., or use the Request Card at page 18. Circle No. 78.

Loader traction improved with detachable grousers

A new type of removable grouser, which bolts onto the street shoes of its TerraTrac crawler tractor shovels, is announced by the J. I. Case Co.

Available for the new 1½ and 2-cubic-yard models, the grousers are said to greatly improve traction when working in mud, sand, or on steep slopes. A set of 10 grousers (5 for each track) can be attached with an ordinary hand wrench in 10 minutes, and will increase tractor-shovel production up to 30 per cent in slippery going, the manufacturer reports. A special triangular design is said to prevent dirt from packing in back of grousers, thus assuring good traction even in extremely sticky mud.

According to the firm, the new 80 and 100-hp Case TerraTrac units are able to use grousers without danger of damaging the power train. A hydraulic torque-converter drive cushions shocks and automatically adjusts tractor speed to changing loads.

The new-type grousers are said to be easily removed so they do not interfere with normal operation of the tractor on hard ground.

For further information write to Industrial Div., J. I. Case Co., Dept. C&E, Racine, Wis., or use the Request Card that is bound in at page 18. Circle No. 23.

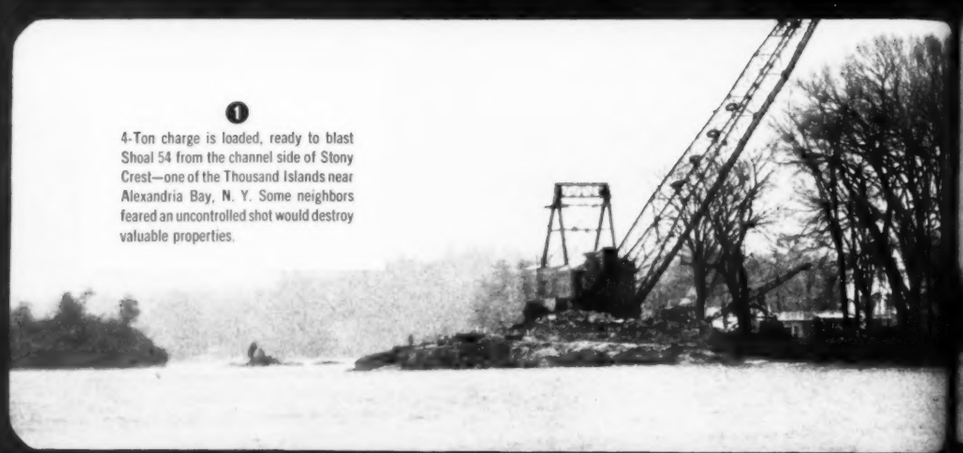
Surplus generating plant is self-contained unit

A self-contained generating plant, described as U. S. Air Force surplus equipment, is offered by the Illinois Mfg. & Supply Co. The 3,000-w, 110-volt dc Delco generator is directly connected, through a flexible coupling, to a Wisconsin air-cooled, 4-cycle-type gasoline engine operating at 2,800 rpm.

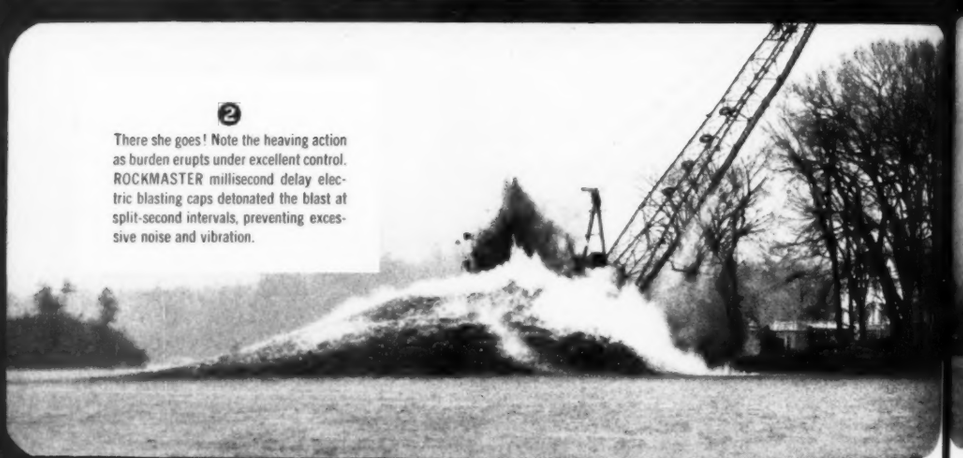
The unit includes a switch box for voltage control, voltmeter, field rheostat, four outlets, and overload protection. A reel hook accommodates 200 feet of conductor wire.

The generator is said to operate all ac-dc series-wound motors, portable tools, soldering irons, lights and other similar equipment. It also charges 24-volt batteries.

For further information write to the Illinois Mfg. & Supply Co., Dept. C&E, 1829 S. State, Chicago 16, Ill., or use the Request Card at page 18. Circle No. 32.



❶ 4-Ton charge is loaded, ready to blast Shoal 54 from the channel side of Stony Crest—one of the Thousand Islands near Alexandria Bay, N. Y. Some neighbors feared an uncontrolled shot would destroy valuable properties.



❷ There she goes! Note the heaving action as burden erupts under excellent control. ROCKMASTER millisecond delay electric blasting caps detonated the blast at split-second intervals, preventing excessive noise and vibration.

SHOAL FIFTY-FOUR
IS NO MORE

Rockmaster blast pays off in pay-yards of rock . . . . . with good public relations in the bargain!

The Jeep Model FC-170 has a wheel-base of 103.5 inches and carries a gross vehicle weight rating of 7,000 pounds.

New 4-wheel-drive unit has 7,000-pound rating

A larger, more powerful vehicle in the new series of Jeep forward control models is available from Willys Motors, Inc.

Identified as Model FC-170, the new heavy-duty truck has a wheel-base of 103.5 inches and carries a gross vehicle weight rating of 7,000 pounds.

The up-front location of the cab, situated well forward of the engine, is said to allow maximum usage of the vehicle's wheelbase for payloads, as well as placing the driver in excellent position for all-direction visibility. The pickup or stake bodies provide a full unobstructed 9 feet of cargo length.

The unit's Super-Hurricane engine is coupled with 4-wheel drive to provide heavy-duty service over rough terrain.

The FC-170 offers nine forward and three reverse power combinations with standard transmission, and twelve forward combinations with optional 4-speed transmission.

Equipped with power take-off, the FC-170 becomes a source of stationary power available at the rear for powering winches or belt and shaft-driven equipment, and at the center for operation of generators, welders, and other bed-mounted machinery.

The FC-170 has an overall length of 181.5 inches; width of 76.75 inches; and height of 79.5 inches.

For further information write to Willys Motors, Inc., Dept. C&E, 1505 N. Cove Blvd., Toledo 1, Ohio, or use the Request Card at page 18. Circle No. 25.

New cutting head design for masonry saws

Its new BrikSawMatic, featuring Full-Vue cutting head and Eveready control crank, is announced by the Eveready BrikSaw Co.

The new cutting head is said to provide unlimited vision and unobstructed hand clearance. It is always level and ready to cut immediately.

One of the features of the new BrikSawMatic is its Full-Vue cutting head.

There are no rollers, pull knobs, slides or gears to wear out.

The recessed crank is out of the way, yet easily reached for right or left-hand use. One simple operation positions the blade height for any size material. There are no angle adjustments to make.

The BrikSawMatic is powered by a 2-hp continuous-duty, totally enclosed, dustproof motor said to develop in excess of 5 horsepower.

For further information write to the Eveready BrikSaw Co., Dept. 549, Dept. C&E, 1509 S. Michigan Blvd., Chicago 5, Ill., or use the Request Card at page 18. Circle No. 84.

❸ Blast at its height. Earlier millisecond delays established the direction of explosives force, exerting maximum rock-shattering effect. This is how good fragmentation is achieved, along with the control necessary for a shot of this type.

❹ Shot completed. Shoal 54 is well broken for easy shoveling. Note dragline was kept nearby to go into action at once. Powder factor: only 1.6 lbs. of explosives per pay yard of rock! Job economy and good public relations maintained!

Deepening the channel for the St. Lawrence Seaway involves blasting out shoals in the Thousand Islands—with swanky summer homes nearby. This calls for skillful shooting.

The blast illustrated here, handled by Tecon Corporation of Dallas, Texas, highlights the efficiency of the Atlas ROCKMASTER® System in producing economical dredging while maintaining good public relations.

Approximately 12,000 tons of rock were blasted to remove this portion of Shoal 54 from Stony Crest Island, Alexandria Bay. Drilling was done from land instead of barge. Four tons of Atlas Giant Gel were loaded in a vertical fan arrangement through flexible tubes. Despite three days required for loading, Atlas triple-wrapped cartridges remained in perfect condition.

Results . . . without troubles

ROCKMASTER millisecond delay electric blasting caps detonated the shot in a diagonal delay pattern . . . exerted maximum explosives force against the rocky shoal. Careful stemming prevented sharp air blast. ROCKMASTERS kept noise and vibration to a minimum. Result: an economical, productive shot—and no blast from home owners!

Let your nearest Atlas representative show you how to get results like this with Atlas methods and materials. And write for "*Better Blasting*," the informative Atlas newsletter.

EXPLOSIVES DIVISION
ATLAS POWDER COMPANY
WILMINGTON 99, DELAWARE
offices in principal cities

For more facts, use Request Card at page 18 and circle No. 312

The Le Roi Model 600RD2 600-cfm rotary air compressor has a dry weight of 7,730 pounds and a turning radius of 11 feet 11 inches.

Lightweight, 600-cfm rotary air compressor

A lightweight, short-turning rotary air compressor is announced by the Le Roi Division, Westinghouse Air Brake Co. Designated the Le Roi 600RD2, the unit is a portable, 2-stage sliding vane type rotary air compressor rated at a free air capacity of 600 cfm. Dry weight of the unit is 7,730 pounds, and it has a turning radius of 11 feet 11 inches.

The compressor is coupled to a GM-71 diesel engine with a hydraulically activated clutch. By use of an automatic variable-capacity regulator and an automatic governor speed control, engine speed varies to match air demands, the manufacturer reports.

The engine-compressor is supported on a unit welded steel frame and is enclosed in a heavy metal housing. Three-point suspension of engine-compressor, including rubber cushion at engine trunnion, protects it against damage from towing distortion over rough terrain. The over-all height is 7 feet 6 inches, with length 12 feet 6 inches, and width 6 feet 8 inches.

Automotive-type steering, tapered roller wheel bearings, and 7.50×16 eight-ply tires provide safe, easy towing.

A feature stressed by the manufacturer is the compressor's unit construction. A side-by-side arrangement of individually cast cylinders is said to provide compactness, ease of inspection, and greater accessibility than in-line or over-under cylinder arangements. The cylinders can be removed separately or with the gear drive as a complete unit. This arrangement allows easy vane inspection, short down-time for service and maintenance in the field, and less expensive component parts, the manufacturer reports.

For further information write to Le Roi Division, Westinghouse Air Brake Co., Dept. C&E, 3716 W. Wisconsin Ave., Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 112.

At the huge dry dock of the New York Shipbuilding Corp., construction is now under way on the 60,000 ton aircraft carrier, the "Kitty Hawk." For this tremendous construction project the two new, 80 ton Whirleys, shown in the center of this illustration, were added to the existing fleet of Clydes.

$120,000,000 construction project uses five Clyde Whirleys

With a four acre flight deck one-fifth of a mile long and an overall height equal to a twenty-five story building, this $120,000,000 construction project requires a tremendous amount of material handling know-how. Placing 52,000 tons of structural steel, 1,000 tons of aluminum, 180 miles of piping, 200 miles of cable . . . keeping materials moving on schedule . . . this is the assignment handed the five Clyde Whirleys by New York Ship.

Clyde's full revolving, self-propelled Whirleys have an established reputation of easiest, safest handling . . . equal load distribution on the fully supported turntable . . . a work-capacity that knows no equal! That's why Clyde Whirleys are preferred on major construction projects, at rail transfer terminals, for extra heavy cargo handling at leading ports around the world.

Whatever your material handling problems, it will pay you well to investigate the complete line of Clyde's *performance-proved* Whirleys, Hoists, Derricks, Whirlettes, Car Pullers, Unloaders, and deck and dock material handling equipment. The use of Clyde's Engineering Department is yours without obligation.

CLYDE RIC

CLYDE IRON WORKS, Inc.
Established 1899
DULUTH 1, MINNESOTA

HOISTS : DERRICKS : WHIRLEYS : UNLOADERS
BUILDERS TOWERS : CAR PULLERS : ROLLERS

For more facts, use Request Card at page 18 and circle No. 313

Double tracing surface eases drawing revisions

A new double-surface, water-repellent tracing cloth, the No. 378WD Whitney, is available from Charles Bruning Co., Inc.

This specially prepared white tracing cloth allows unchanging parts of a drawing to be drawn on one side of the cloth, and details which may be subject to repeated revision to be drawn on the other side. Erasures are said to be made easily on the detail side, without danger of removing information from the other side.

According to the manufacturer, the cloth is impervious to perspiration stains and water spotting, and can be cleaned with common solvents without damage.

The cloth is available in all sheet sizes, and in 20-yard rolls, 30, 36, or 42 inches wide.

For further information write to Charles Bruning Co., Inc., Dept. C&E, 4700 Montrose Ave., Chicago 41, Ill., or use the Request Card at page 18. Circle No. 67.

Self-propelled road broom operates hydraulically

A new self-propelled road broom called the Cyclone is announced by the Lull Engineering Co.

A single engine is used to propel the unit and provide power to its two hydraulic systems. All controls are hydraulically operated. The control levers are conveniently placed to

A single engine is used to propel the Lull self-propelled road broom and provide power to its two hydraulic systems.

allow the single operator to control all broom movements and adjustments without leaving his seat.

The broom is driven hydraulically and can be rotated in either direction, permitting sweeping while the unit is moving either forward or backward. Many turn-arounds and deadheading can be eliminated because of the reversible rotation, the manufacturer reports.

The sweeping angle is controlled hydraulically and can be changed at any time, even while sweeping. The broom can be used at any point throughout the 135 degrees of angle change, permitting sweeping from 45 degrees to either side of the machine to the stowed position, which is when the length of the broom is along the longitudinal axis of the machine.

One of the advantages claimed for this unit is that the operator can always sweep with the wind, keeping himself and the engine out of flying dust.

The Lull Cyclone self-propelled broom is available with either 8 or 10-foot brooms.

For further information write to the Lull Engineering Co., Dept. C&E, 3045 Highway 13, St. Paul 11, Minn., or use the Request Card at page 18. Circle No. 13.

Unit decontaminates foul air from compressors

A decontamination unit for purifying the air that comes from compressors is available from the Logan Engineering Co.

According to the manufacturer, the unit, called the Aridifier, is especially desirable for users of pneumatic tools and spray equipment. It is said to remove up to 92 per cent of all moisture, oil, dirt, and fine scale in the air line, resulting in less equipment damage and fouled work.

Operated by the compressed air passing through it, the Aridifier impales the foreign matter on whirling rotor blades, then hurls the impurities by centrifugal force against the inside wall of the unit. From this vertical inner wall, the contamination and moisture drip by gravity force into a trap, permitting only clean, dry air to emerge.

For further information write to the Aridifier Div., Logan Engineering Co., Dept. C&E, 4901 W. Lawrence Ave., Chicago 30, Ill., or use the Request Card at page 18. Circle No. 10.

Hydraulic angle iron shear rated at 18 tons

Its Model 607 hydraulic angle iron shear is offered by the W. A. Whitney Mfg. Co.

Despite its small size, the machine is said to have a capacity of 18 tons.

According to the manufacturer, it will shear angle iron up to $4\times4\times\frac{1}{4}$-inch; flat stock up to $\frac{3}{8}\times3\frac{1}{2}$ inches; squares up to $\frac{1}{2}$-inch hot roll low-carbon; and rounds up to $\frac{5}{8}$-inch, using a regular angle iron shear and die blade.

By using screw-in miter block, any angle up to 45 degrees may be cut.

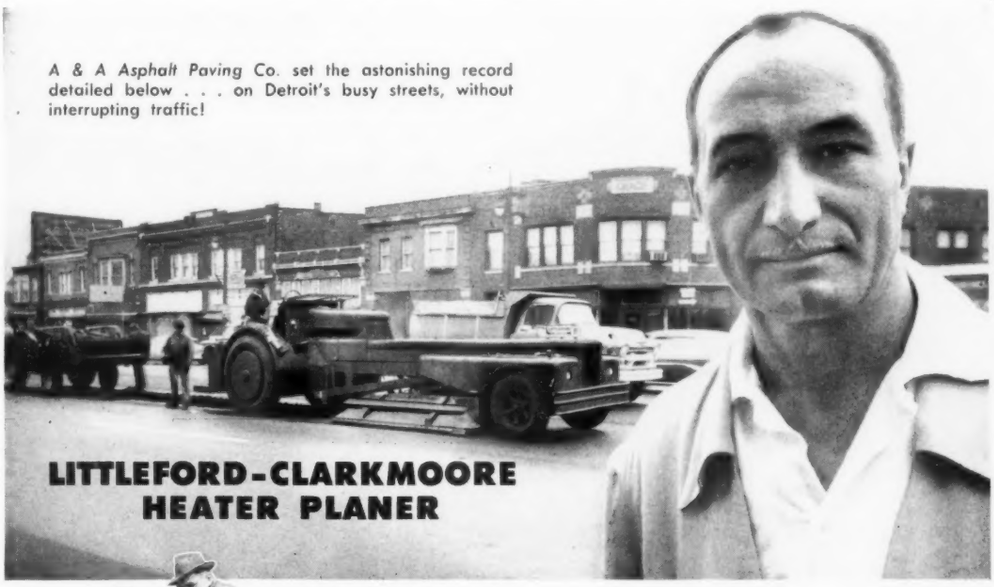
With bending dies, the shear will form 90-degree right-angle bends in rounds, squares, or in flat stock 6 inches wide by $\frac{3}{8}$-inch-thick mild steel.

The shear removes a $\frac{3}{8}$-inch-wide piece with no distortion to the ends of the bar, the manufacturer reports. Side-thrust blocks guide the shear, preventing damage to the blade and die or wear on the cylinder walls.

The shear is operated by a foot treadle.

For further information write to the W. A. Whitney Mfg. Co., Dept. C&E, 636 Race St., Rockford, Ill., or use the Request Card at page 18. Circle No. 128.

A & A Asphalt Paving Co. set the astonishing record detailed below . . . on Detroit's busy streets, without interrupting traffic!



LITTLEFORD-CLARKMOORE HEATER PLANER

Heats and planes 81" wide path all in one continuous operation. Windrows material behind for easy pick up.

CUTS CONTRACT TIME FROM 24 MONTHS TO 33 DAYS!

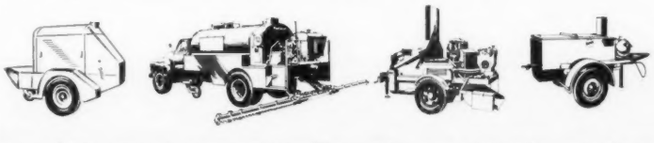
"1,500 square yards planed per day."

"2½ miles of black top planed off Gratiot Avenue (Detroit) in 14 days."

"Records like that—impossible before, but now routine with the new Littleford-Clarkmoore Heater Planer—helped us complete in 33 days a road maintenance contract that would have taken 24 months the old way!"

That's the record established last fall by A & A Asphalt Paving Co., Birmingham, Michigan, according to Reno Ministrelli, President. The efficiency of the Littleford-Clarkmoore Heater Planer also enabled the company to reduce its crew from 125 to 14, and equipment from 25 trucks to 4.

Equally astonishing records are being set in New York City, Birmingham, Ala., Chattanooga, Tenn., Harrisburg, Pa. . . . by contractors *and* highway departments. For a better understanding of what this modern, high-speed Littleford-Clarkmoore street and highway planing can mean to you, send for your free Heater Planer Portfolio. Littleford Bros., Inc., Dept. LB 257—485 E. Pearl St., Cincinnati 2, Ohio



1882 - 1957 75 LITTLEFORD BROS. INC. CINCINNATI TOPS IN BLACK TOP

world's *most complete line* of *completely engineered* black top equipment

For more facts, use Request Card at page 18 and circle No. 314

The Clark Model CY-200 outdoor fork truck with dual-drive tires has a lifting capacity of 20,000 pounds. The unit is equipped with continuous follow-up-type hydraulic power steering, said to operate throughout the engine speed range to permit fast, easy turning at any speed.

Outdoor fork truck has 10-ton capacity

A 20,000-pound-capacity outdoor fork truck with dual-drive tires is announced by the Industrial Truck Division, Clark Equipment Co. Designated the CY-200, the machine features equal weight distribution, a planetary drive axle, and 10.00×20 tires for driving through mud, sand, and over rough terrain. The unit has continuous follow-up-type hydraulic power steering, said to operate throughout the engine speed range to permit fast, easy turning at any speed.

A Hercules JXD 6-cylinder gas engine powers the CY-200. Engine power is transmitted by a Clark torque converter and 4-speed powershift transmission. Power brakes are standard. When loaded, the unit will travel more than 20 mph in both forward and reverse, and will climb a 22.7 per cent grade, the manufacturer reports.

Dimensions of the CY-200 are: length, 187¾ inches; width, 96 inches; outside turning radius, 176 inches; wheelbase, 130 inches; and an underclearance of 9 inches at the upright.

For further information write to the Industrial Truck Div., Clark Equipment Co., Dept. C&E, Battle Creek, Mich., or use the Request Card at page 18. Circle No. 27.

Announce pipe-driving attachment for backhoe

A new attachment—custom-built for the firm's hydraulic backhoe—for driving pipe or service lines under roads or sidewalks is announced by the Henry Mfg. Co., Inc. Designated the Henry Ram-A-Rod, this pipe pusher will push or pull ¾-inch to 3-inch pipe or tubing.

The Ram-A-Rod is a compact unit which replaces the bucket on the Henry Backhoe. The Henry Hydraulic system and ground-rooted mainframe hold the pipe pusher in a fixed position. The bucket cylinder provides the actuating power.

The pipe pusher has a 6-inch driving stroke and will deliver approximately 30 tons of pressure on the push pipe.

The Ram-A-Rod, which will push through sand, clay, or rocky soil, reverses instantly. Because of its ability to pull pipe out quickly if a major obstruction is encountered, it is never necessary to cut pipe off and leave it in the hole, according to the manufacturer.

Approximately 53 inches in length and 14 inches wide, the unit has tempered tool steel driving jaws. The machine, which has only 17 parts, is said to be practically maintenance free.

For further information write to the Henry Mfg. Co., Inc. Dept. C&E, 1700 N. Clay St., Topeka, Kans., or use the Request Card at page 18. Circle No. 85.

Why use automobile grease in heavy-duty equipment?

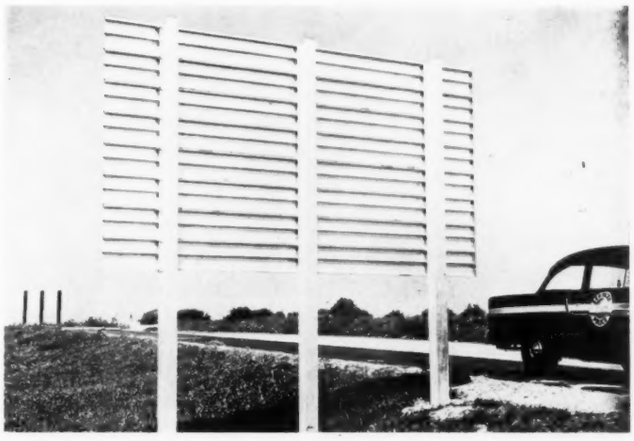
Let's not kid ourselves about the difference between the lubrication requirements of automobiles and heavy-duty machinery. D-A Lubricants are compounded specifically for heavy-duty equipment. There is a right one for every application.

For example, D-A Track Roller Lubricant • D-A Type AC Track Roller Lubricant • D-A Winter Track Roller Lubricant • D-A Open Gear • D-A Torque Fluid • D-A Lithium, Extra-Heavy.

Let your D-A Representative give you all the facts on how D-A Lubricants can reduce parts wear and minimize downtime . . . *increase the return on your equipment investment.*

D-A Lubricants make equipment last longer

For more facts, use Request Card at page 18 and circle No. 315



Extruded aluminum panels, engineered by the Reynolds Metals Co., are now in use as signs on the new Florida Sunshine State Parkway, as well as the Kentucky, Pennsylvania, New Jersey, and Oklahoma turnpikes. The panels can be assembled into highway signs as large as 12×30 feet merely by interlocking the required number of panels and attaching them to supporting posts by means of hook bolts. In case of damage due to vandalism—biggest single reason why excessive maintenance is necessary—only one panel need be replaced, not the entire sign. For further information about these aluminum panels, wrtie to the **Reynolds Metals Co.**, Dept. C&E, 2500 S. Third St., Louisville, Ky., or use the Request Card at page 18. Circle No. 126.

For more data on any item, circle indicated number on card at page 18.

New truck crane fits most 1½-ton units

An all-new universal-fit crane, designed to fit almost any new or used 1½-ton truck, is announced by Sherman Products, Inc.

The crane attaches with six U-bolts to any 1½-ton truck having a minimum cab-to-rear-axle measurement of 92 inches.

According to the manufacturer, the machine has the power and reach to set steel, and can move 30 yards of dirt per hour when used as a dragline. It uses a standard industrial power unit, and the principal wearing parts such as clutches and brakes are standard truck parts.

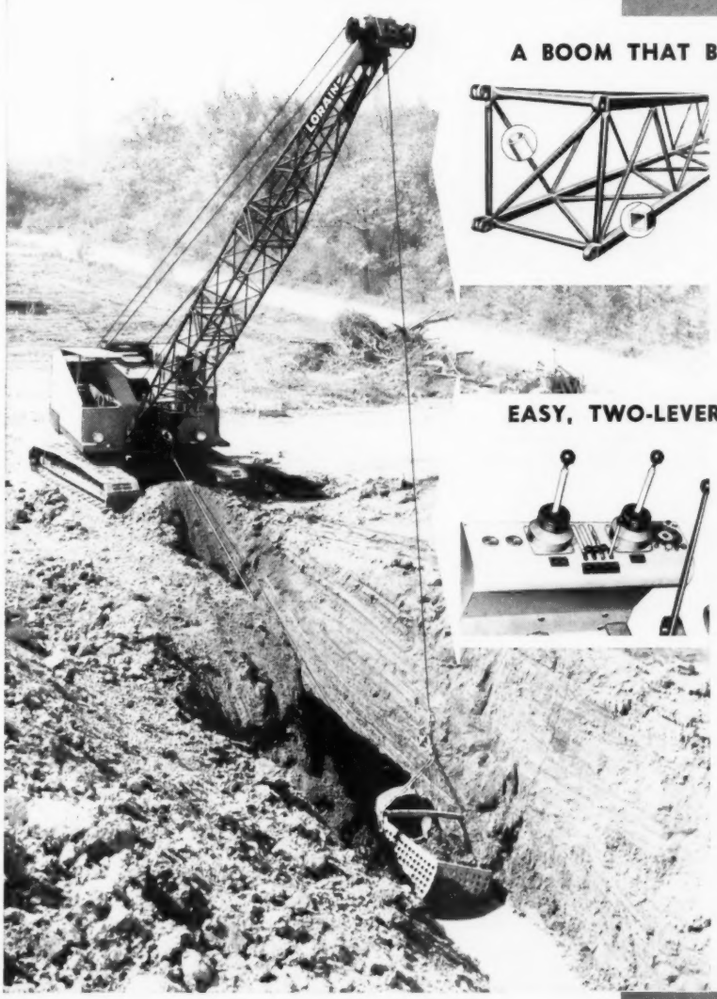
The Sherman crane unit has a minimum boom of 20 feet, and a maximum of 40 feet. The standard boom is 25 feet. The hoist raises and lowers the boom independently of other functions. The crane unit has an all-weather cab. Safety glass is mounted in rubber to provide a safe, comfortable place for the operator.

For further information write to Sherman Products, Inc., Dept. C&E, 3200 W. 14 Mile Road, Royal Oak, Mich., or use the Request Card at page 18. Circle No. 35.

This Sherman crane attaches to any 1½-ton truck having a minimum cab-to-rear-axle measurement of 92 inches. It uses a standard industrial power unit and the principal wearing parts are standard truck parts.

At boom tip...and finger tip... Here's NEW PROFIT–PERFORMANCE

HEAVY-DUTY ¾-YD.
LORAIN-26



A BOOM THAT BOOSTS PRODUCTION

Stronger—yet lighter—the weight-saving design of the LORAIN SQUARE-TUBULAR-CHORD BOOM* increases lifting capacities and permits greater operating ranges. Continuous, round tubular lacing, welded to the square chords at common points gives a "banded" effect for added strength. Pin-connected for easy insertion of center section.

EASY, TWO-LEVER POWER CONTROLS

This new Lorain exclusive—two-lever, "Joy-Stick" power control reduces operator fatigue, provides faster, smoother operation, increases production. Full "feel" of machine is retained.

Send for LORAIN-26 catalog

Yours for the asking is a 24-page catalog, detailing the many profit-making advantages of the heavy-duty ¾-yd. Lorain-26. Ask your Thew-Lorain Distributor for a copy or write direct.

*U.S. and foreign patents applied for.

Feature-packed! That's the heavy-duty ¾-yd. Lorain-26. Hydraulic power control of crawler . . . hydraulic coupling or torque converter power-take-off available . . . truss-type turntable bed . . . and many others. This versatile performer operates profitably as a shovel, dragline, crane, clamshell or hoe. It's a real performer—has the brawn to tackle the toughest digging or lifting jobs. Contact your nearby Thew-Lorain Distributor to "action-test" the Lorain-26.

THEW LORAIN®

THE THEW SHOVEL CO.
Lorain, Ohio, U. S. A.

For more facts, use Request Card at page 18 and circle No. 316

Box channels require no welding or riveting during field erection of Bethlehem's new bridge railing. Each section is fitted with a male sleeve.

Bridge rail features ease of installation

A new bridge railing said to offer the utmost in simplicity during field erection, as well as excellent safety features and open beauty, is being marketed by Bethlehem Steel Co.

The railing consists of steel box channel rails supported on malleable iron intermediate and end posts. Box channels and posts arrive at the bridge site ready for installation. No welding or riveting is required; only a few bolts and screws must be tightened.

Box channel rails are furnished in any length from 7 to 20 feet. Intermediate posts are spaced on 10-foot centers. The 2×5-inch box channel rails are cold formed from $\frac{1}{8}$-inch steel sheet, galvanized to conform with ASTM Spec. A-123.

Like the rails, posts are galvanized in accordance with ASTM Spec. A-123. Posts are connected to the bridge parapet by four $1\frac{1}{8}$-inch-diameter anchor bolts set in the concrete.

Bolts are secured to the top concrete form prior to placing the concrete. The anchor bolt is drawn tight by the two nuts, one above and one below the form. After the concrete has set, the top nut is removed and the top form slipped off. Bolts must then be perpendicular to the surface of the parapet.

The new bridge railing is made in two standard types—open and closed. In both types, one, two, and three-rail designs are available.

For further information write to Bethlehem Steel Co., Dept. C&E, 701 E. Third St., Bethlehem, Pa., or use the Request Card at page 18. Circle No. 80.

Announce masonry saw with simplified control

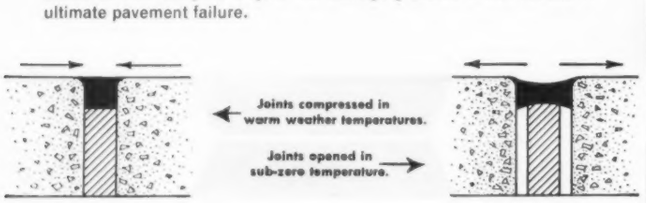
A masonry saw that gives the operator complete front-end control of all machine functions and adjustments has been developed by Felker Mfg. Co.

Many features of the saw are said to increase operator efficiency. The arbor can be raised or lowered to any column slot with minimum effort by one man and without moving from the operating position. Fast changes in arbor tilt are the result of a new front lever control. The arbor may be rigidly locked against vertical travel when the saw is diamond-blade cutting. A

Special Joint Sealing Compounds
resist damage caused by
Aircraft Fuel Spillage

keeps joints in airport concrete safely sealed under all conditions

The deteriorating effect of aircraft fuel and other petroleum solvents which come in contact with ordinary joint sealing material used on concrete runways, aprons and taxi strips, causes serious pavement damage and expensive maintenance. Once the seal of an expansion, contraction or dummy joint is broken the infiltration of water and foreign materials into the joint begins the damaging action which results in ultimate pavement failure.



The development of two special sealing materials—Hot Poured Para-Plastic® JF and Cold Applied Zero-Lastic® JF—which are impervious to petroleum solvents and are unaffected by extremes of temperature, has eliminated the damage caused by spillage of jet fuel and other petroleum solvents.

Both materials form a resilient and adhesive seal which maintains bond with the concrete at sub-zero temperatures. Their stability is constant and they will not become soft and fluid during high summer temperatures. (See drawings above.) Hot Poured, Para-Plastic JF and the cold applied Zero-Lastic JF are widely used, not only in new construction, but in maintenance of old concrete pavement as well. Both compounds can be pumped into the joint with readily available equipment. Hot Poured Para-Plastic JF meets Federal Spec. SS-S-167, and Cold Applied Zero-Lastic meets Federal Spec. SS-S-170.

For more details on Hot Poured Para-Plastic JF and Cold Applied Zero-Lastic JF, write the manufacturer:

SERVICISED PRODUCTS CORPORATION • 6051 West 65th Street • Chicago 38, Illinois
For more facts, use Request Card at page 18 and circle No. 317

CAL-TIE® WIRE
in the handy reel dispenser

...Safe

Tying reinforcing bars with Cal-Tie Wire on the convenient reel dispenser is safer than the old-fashioned shoulder coil. There's no awkward coil to catch on protruding objects...no danger of eye injuries...no scratches on neck and ears...and Cal-Tie's unusually smooth surface makes tying easier.

...Economical

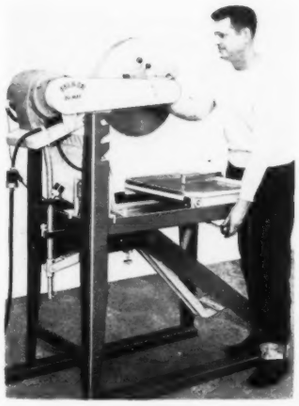
Cal-Tie Wire gives more ties per pound. That's because workers can cut the desired length they need... when they need it...don't have to clip off long, useless wire ends after each tie. They can perform other duties without discarding their partially-used supply of tie wire.

Your nearby CF&I representative will be happy to give you complete details on this safe, economical and modern way to tie rebars, etc. Why not see him soon?

CF&I CAL-TIE WIRE

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Casper • Denver • El Paso • Ft. Worth • Houston • Lincoln (Neb.) • Oklahoma City • Phoenix • Pueblo • Salt Lake City • Wichita
PACIFIC COAST DIVISION—Los Angeles • Oakland • Portland • San Francisco • Seattle • Spokane
WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia
CF&I OFFICES IN CANADA: Toronto • Montreal CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver • Winnipeg

For more facts, use Request Card at page 18 and circle No. 318



The new Felker saw cuts wet or dry and accommodates either 14 or 18-inch blades.

blade depth control is now furnished to stop the blade at any desired depth of cut. Also, to increase blade power, a non-slip timing belt is incorporated which totally eliminates belt slippage.

The new Felker saw cuts wet or dry and accommodates either 14 or 18-inch blades. Motors are lightweight ($1\frac{1}{2}$ or 2 horsepower depending upon blade size) and operate on either 110 or 220 volts ac.

Although designed primarily for diamond-blade cutting, the Felker saw can also be used with abrasive wheels with the same high efficiency.

For further information write to Felker Mfg. Co., Dept. C&E, 1128 Border Ave., Torrance, Calif., or use the Request Card at page 18. Circle No. 81.

New trencher eliminates backfilling both sides

A high-capacity, vertical bucket-type trencher designed for use with the International Harvester Model 350 utility tractor is available from the Earth Equipment Corp. Designated the Everett trencher Model Super S 350, the unit is equipped with hydraulic controls that permit disposal of dirt on either side of the trench.

Capacity of the new trencher is reportedly estimated at 9 fpm maximum, governed by soil conditions and depth of operation. Digging depth is 4 feet. Standard cutting width is 12 inches, though 14, 16, or 18 inches may be attained with attachments.

Eighteen open-back buckets for easy dumping over the conveyor are attached to the chain line. Easily replaceable bucket teeth are compounded from high-tensile, heat-treated alloy steel.

Trenching operations with the Model Super S are hydraulically controlled from the operator's seat on the tractor through an independent hydraulic system.

Features of the 72-inch-wide Earthco backfill blade include reversible cutting edges and two hydraulic lift cylinders using the Everett trencher control valve.

For further information write to the Earth Equipment Corp., Dept. C&E, 2036 Sacramento St., Los Angeles 21, Calif., or use the Request Card at page 18. Circle No. 110.

CUT COSTS—SAVE HIGH RENTAL CHARGES!

REVOLUTIONARY, ALL NEW WARNING LIGHT! DUO TRANSISTORIZED SAFETY

BRIGHTER LIGHT · LONGER DWELL · YEARS OF DEPENDABLE SERVICE · GREATEST ECONOMY—LESS THAN 2¢ A DAY TO OPERATE · RUGGEDIZED STEEL CONSTRUCTION · NO FIRE OR EXPLOSION HAZARD · USES LATEST FILAMENT TYPE BULB

Pat. Pend.

ONLY GARDRITE HAS, THE HERMETICALLY SEALED TRANSISTORIZED FLASHER · HEART OF THE GARDRITE FOR YOUR FULL PROTECTION · WEATHERPROOF · WILL OPERATE UNDER WATER

PRICE $19.95 Quantity discounts

TAMPER PROOF MOUNTING
Special tool furnished. Easily installed on any standard barricade.

90° SWIVEL HEAD
Light in any direction.

WRITE FOR FOLDER

5 YEAR GUARANTEE

ELECTRADE CORPORATION
2617 Walnut St. · Kansas City 8, Mo.
Phone Victor 2-8519

For more facts, use Request Card at page 18 and circle No. 319

NOW... a new note in home-building efficiency... RCA 2-Way Radio!

Mobile radio installation plays sweet music for Beverly Hills Construction firm!

The two-way radios installed in the maintenance vehicles, sales and other executive cars of the Larwin Company—top rated builders of homes in Southern California—transmit talk, not music! But, it pays off in sweet profits . . . by keeping them in touch with project sites often several miles apart. Communications costs have been cut by $500 per month, to mention one big saving.

Other advantages are reported by three key officials . . . Sidney Cagan, Sales Manager, notes a 100% increase in efficiency in his operation, faster escrow clearances, extra good service to customers. Purchasing Agent B. M. Moore says it speeds up completion work by keeping superintendents informed of delivery schedules. With more than 1000 homes in 5 different tracts, the maintenance crew under Ed Meibos saves thousands of dollars annually for the company by getting the jump on sudden repairs and storms, eliminating needless trips. In real emergencies, such as accidents to workmen, the radio proves invaluable in getting medical attention without delay.

The Larwin Company is enthusiastic about two-way radio and, as a builder of fine homes, Larry and Bill Weinberg's successful firm has understandably standardized on the finest in radio . . . RCA.

Larwin Company installation consists of RCA Citizens Band Radio, Carfone-450. Four 15-watt base stations, 2 remote control units; 6 15-watt mobile units. Use coupon below for additional information about RCA 2-Way Radio for construction applications.

Mark of RCA Quality Tmk(s) ®

RADIO CORPORATION of AMERICA
COMMUNICATIONS PRODUCTS
CAMDEN, N. J.
In Canada: RCA VICTOR Company Limited, Montreal

Radio Corporation of America
Communications Products
Dept. X-277, Building 15-1, Camden, N.J.

☐ Please send me complete information on RCA 2-Way Radio use in the construction business.

☐ Have RCA Communications specialist make a FREE radio survey of my operation.

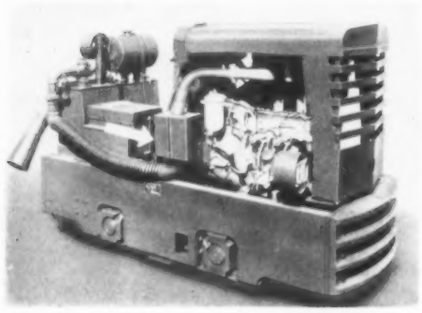
NAME_____ TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

For more facts, use coupon, or Request Card at page 18 and circle No. 320



Engineered for tunnel work, the Universal 1½-ton locomotive is powered by an 18-hp Deutz diesel engine. Arrow points to its Dieseler catalytic purifier.

Small diesel locomotive designed for tunnel work

A 1½-ton underground diesel locomotive for tunnel work is announced by the Hack Engineering Co.

A hydraulic-driven unit, the new Universal locomotive is said to be simple in construction, easy to maintain, and to generate equal speed and power in both directions. It develops gradual power, important in picking up train loads. Powered with a Deutz 18-hp diesel engine, it has a drawbar pull rated at 650 to 700 pounds.

The unit is equipped with a Dieseler catalytic purifier that reportedly removes 65 to 85 per cent of hydrocarbons and 80 to 90 per cent of carbon monoxide. The purifier is manufactured by Oxy-Catalyst, Inc.

For further information write to the Hack Engineering Co., Dept. C&E, 124 Wazee Market, Denver, Colo., or use the Request Card at page 18. Circle No. 3.

Wire hoisting cable transmits voice signals

Wire rope that can transmit voice communication through its center core, and at the same time perform hoisting and similar operations, is announced by the Wire Rope Division, American Chain & Cable Co., Inc.

Designated SignalKore wire rope, it can be used with standard phones or the newer sound-powered phones.

The product is available in 11 rope diameters in sizes of ¾, ⅞, 1, 1⅛, 1¼, 1⅜, 1½, 1⅝, 1¾, 1⅞, and 2 inches inclusive. Breaking strength for the smallest diameter is 47,600 pounds for the bright and galacco finish; 42,840 pounds for the galvanized finish; and ranges to 320,000 pounds and 288,000 pounds, respectively, for the 2-inch-diameter rope.

Cores for the ¾, ⅞, and 1-inch-diameter ropes are supplied with two conductors. Ropes 1⅛ inch in diameter and larger have three conductors. The conductors are of the same size and type for all wire ropes and are equivalent in circular mil area to a 22-gage copper wire. Each conductor has an electrical resistance of approximately 26 ohms per 1,000 feet.

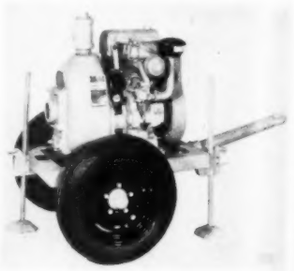
For further information write to Wire Rope Div., American Chain & Cable Co., Dept. C&E, 929 Connecticut Ave., Bridgeport 2, Conn., or use the Request Card at page 18. Circle No. 6.

Trailer-mounted pumps permit exact leveling

Pumps mounted on heavy-duty trailers are available from the Rice Pump & Machine Co. The mounting is offered on the firm's 20M, 30M, 40M, and 90M models, sizes 3 through 6 inches. Automotive-type jacks have been adapted to the units as steadying stands to permit exact leveling.

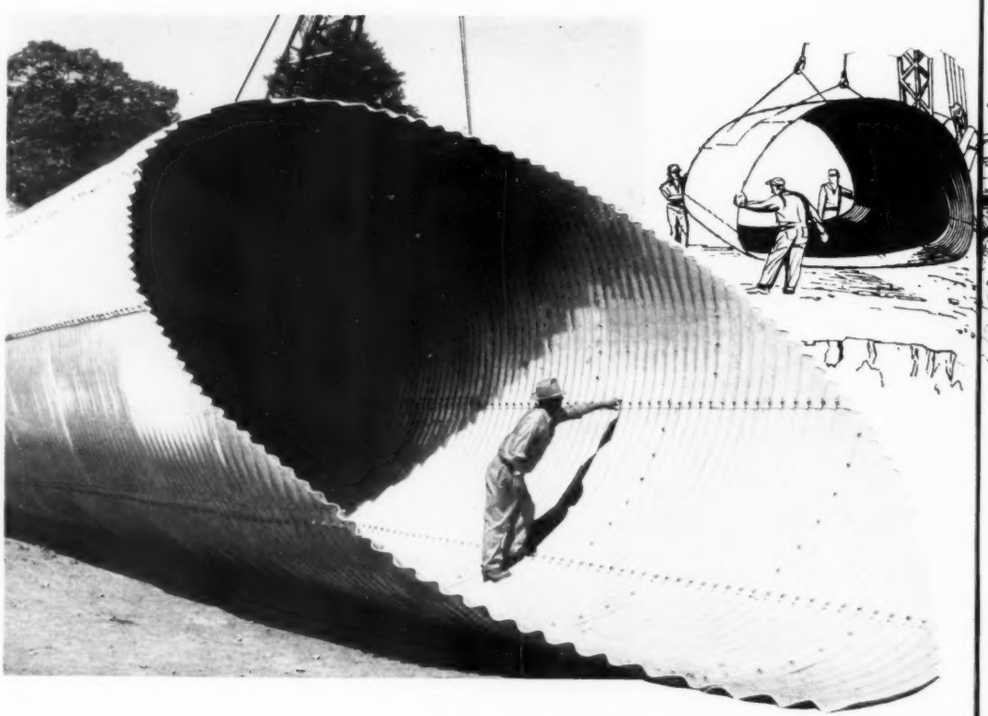
The Timken taper roller-bearing wheels are equipped with standard 5.90×15 implement tires for ease in handling on rough ground. The towing tongue telescopes when not in use. The mounting has a large towing ring. According to the manufacturer, it tows easily from job to job.

Write to the Rice Pump & Machine Co., Dept. C&E, 400 Park Ave., Belgium, Wis., or use the Request Card at page 18. Circle No. 9.



For Permanence, Economy, an[d] Spee[d]

TWO USS PRODUCTS FO[R] A[N] LARGE O[R] SMA[LL]



USS AMBRIDGE SECTIONAL PLATE

PIPE · PIPE-ARCH · ARCH

USS AMBRIDGE Sectional Plate Pipe, Pipe-Arches and Arches are available in a *complete range* of standard sizes to satisfy design requirements for any waterway opening. These flexible structures, with their 6″ x 2″ corrugations, can resist extremely large externally applied loads.

Special details such as asphalt coating, hook bolts, beveled ends, and skewed ends are furnished as specified for each job. These structures are economical, permanent, and go in quickly with minimum traffic interruption.

SEND FOR NEW CATALOG

Containing complete information on AMBRIDGE Sectional Plate, our new 28-page catalog covers such details as design, sizes, weights, gages, and assembly instructions. For your free copy, just send your request to American Bridge Division, U. S. Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa.

USS

AMERICAN BRIDGE DIVISION, UNITED STATES STEEL CORPORATION
GENERAL OFFICES: 525 WILLIAM PENN PLACE, PITTSBURGH, PA.

UNITED STATES STEEL

A new design feature of the Model M Blaw-Knox Trukmixers, providing an auxiliary method for introducing tempering water, is incorporated in five new M-55's now in use by the Radcliff Gravel Co., of Mobile, Ala. The system permits the operator to introduce mix water through the charging end of the mixer as well as through the drum head, eliminating the tendency of concrete to build up on mixer blades at the drum opening as the tempering and flush water is jetted against the blades. For further information about this new system, write to the **Blaw-Knox Co.**, Dept. C&E, 300 Sixth Ave., Pittsburgh 22, Pa., or use the Request Card at page 18. Circle No. 94.

Offer tractor-lift with 2-ton lifting capacity

A new tractor-lift, for use with International Harvester and John Deere wheel and crawler tractors, is announced by the Henry Mfg. Co., Inc.

Three models are available. The Model TL-4316 features a 3-rail mast. Its 16-foot lifting height telescopes to a 93-inch down height, for clearing low doors and overhangs. Henry's Model TL-2310, also a 3-rail lift, goes 10 feet high and has a 64-inch down height. The third model (TL-4210) has a 2-rail mast, affording a 10-foot lift and 87-inch down height. All models have a ground clearance of 12 inches.

The capacity of the unit, rear mounted, is 4,000 pounds.

Each model offers three methods of mounting on the tractor: it can be rear-mounted, rear-mounted with operator reversed, or front-mounted.

Tractor-lift attachments include boom crane, dozer blade, concrete block tines, snow plow, cement hopper, personnel platform and bulk materials bucket.

The fork tines are made of heat-treated alloy steel and are available in 36 and 42-inch lengths.

These tractor-lifts can maneuver in mud or snow, and pass over chuck holes and clutter that would stall a smaller-wheeled vehicle, according to the manufacturer.

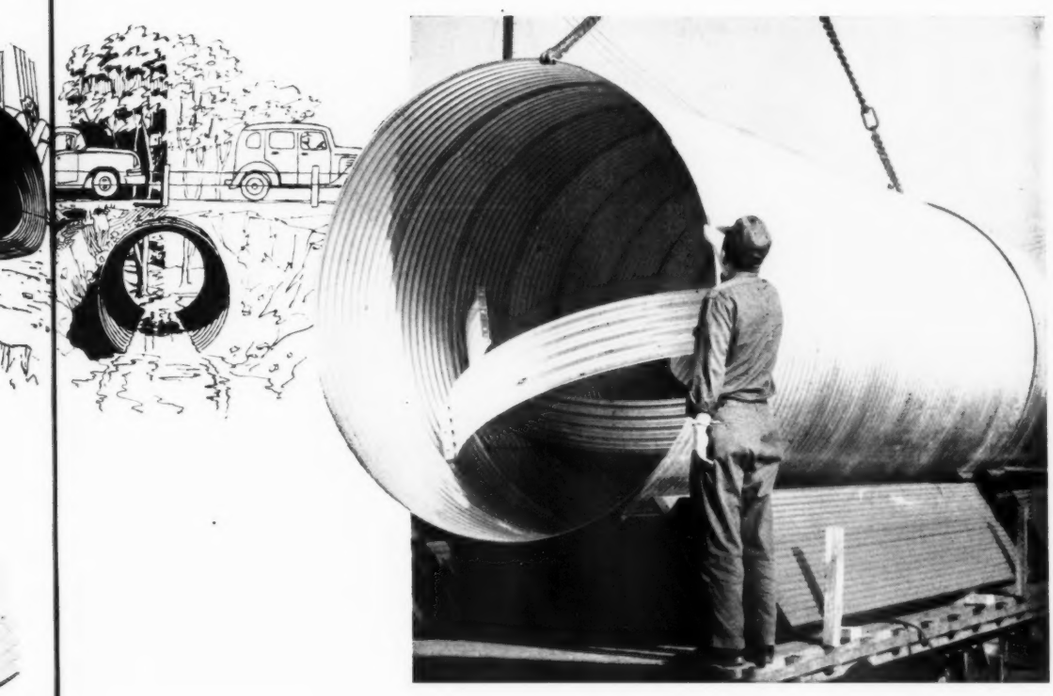
For further information write to the Henry Mfg. Co., Inc., Dept. C&E, 1700 N. Clay St., Topeka, Kans., or use the Request Card at page 18. Circle No. 12.

—For more facts, circle No. 321

...speed of Installation

...DRAINAGE STRUCTURES

...SMALL



USS GALVANIZED CULVERT SHEETS

...Culverts made from USS Galvanized Corrugated Culvert Sheets provide a lasting economical means of handling drainage problems. They will carry more load than rigid-type structures, and readily absorb the forces of impact and vibration.

These advantages, plus the fact that metal culverts are not subject to breakage, require no maintenance, cost less to install and are easy to ship and handle, make them ideal for most drainage purposes.

NEW CATALOG AVAILABLE SOON. We are completing a new catalog on USS Culvert Sheets for Metal Drainage Products. Covers design, sizes and weights, gages, installation and other engineering details. For free copy, send your request to United States Steel Corporation, Room 2801, 525 William Penn Place, Pittsburgh 30, Pa.

UNITED STATES STEEL CORPORATION, PITTSBURGH, PA. • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL EXPORT COMPANY, NEW YORK

7-455

UNITED STATES STEEL

A hard-facing operation being performed on an earthmoving bucket illustrates the flexibility of the Amsco semiautomatic welding machine as adopted for use with the new Amsco tubular welding wire; the 14-foot cable that feeds the welding wire can be quickly moved to the welding job. With these new electrodes, not only is welding faster, but deposits are more uniform, and the quality of the weld is greatly improved, according to the manufacturer. For further information about the Amsco semiautomatic welding machine and new tube wires, write to the **Amsco Div., American Brake Shoe Co.**, Dept. C&E, 395 E. 14th St., Chicago Heights, Ill., or use the Request Card at page 18. Circle No. 101.

Sweeper can be mounted on any front-end loader

Its Model EL-C end-loader sweeper, which can be mounted on the front of any tractor end loader, is announced by Little Giant Products, Inc.

The EL-C has a left-hand drive permitting sweeping in gutters and near the curb. The arms of the end-loader can be raised while the brush is rotating. Speed rotation of the brush is constant and entirely independent of the prime mover.

The end-loader sweeper is available in brush lengths of 6 or 7 feet, filled with either palmyra fiber or spring steel, and the brush can be turned end for end to give even wear.

The new sweeper comes equipped with an independent engine, a choice of either a Wisconsin 7-hp AEN or 14-hp TH.

According to the manufacturer, the sweeper can be mounted or dismounted in minutes. The same pins that hold the bucket are used to hold the sweeper.

A front deflector for windrow sweeping and a sprinkling system and

If it moves...

Timken-Detroit® Brakes can stop it!

the versatile

DLM BRAKE

offers greater flexibility... dependability!

The revolutionary DLM brake will serve effectively with a variety of equipment. It has already proved its value as a control or parking brake, and is used in various sizes on trucks, busses, machinery, farm equipment, cranes, shovels, hoists, golf buggies, lift trucks.

Highly Efficient! The DLM brake is basically a self-energizing two-shoe brake in which both shoes are more efficiently utilized to produce the same amount of work—give equal forward and reverse torque output, regardless of drum rotation.

Simpler! Only 8 parts, with interchangeable shoes and springs. Lubrication is not required. No internal adjustment necessary. Enclosed design guards against entrance of foreign matter and requires only a minimum of maintenance.

Lighter! More Payload Advantages! Improved Timken-Detroit design using lightweight fabricated steel shoes and brake supports saves many pounds over heavier, more costly brakes.

Another Product of... **Rockwell Spring and Axle Co.**

ROCKWELL SRA

TIMKEN-DETROIT BRAKE DIVISION
Ashtabula, Ohio

For every industrial, agricultural or automotive application where braking is required!

For more facts, use Request Card at page 18 and circle No. 322

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DRILLED AND UNDERREAMED
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SPECIAL DRILLING PROBLEMS

Offices in Atlanta, Ga., Pittsburgh, Pa., Washington, D.C.

Wire or phone for a quotation on your next foundation job — *ANYWHERE IN THE WORLD*

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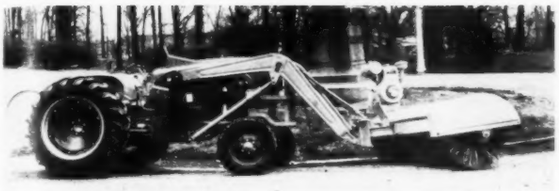
For more facts, circle No. 323



The Little Giant Model EL-C sweeper is adaptable to any tractor end-loader. The arms of the end-loader can be raised while the brush is rotating, and the speed of the brush is constant and entirely independent of the prime mover.

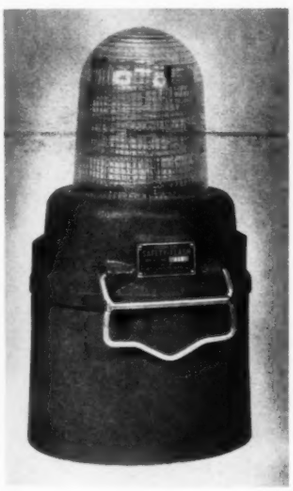
water tank are available as optional equipment.

For further information write to Little Giant Products, Inc., Dept. C&E, 1530 N. Adams St., Peoria, Ill., or use the Request Card at page 18. Circle No. 65.

Warning light sends lateral, vertical signal

A new electric warning flasher light for outlining construction areas is announced by the Port Clinton Mfg. Co.

Designated the Safety Flash, the unit emits red neon warning rays outward 360 degrees and upward simultaneously, giving a complete lateral and vertical warning signal said to be visible for more than one mile. Even in heaviest fog, the light is diffused and reflected by fog parti-



cles and creates a red glow even when the definite dimensions of the light itself cannot be detected, according to the manufacturer.

The light is said to be waterproof, dustproof, and vaporproof, and designed to withstand heavy wind without blowing out, or away, or tipping over. It will operate approximately 150 hours on one battery under normal cycles of 16 hours on and 8 hours off. It is 9 inches in diameter, has an over-all height of 16¼ inches, and weighs 18½ pounds with its 7½-volt Model 4F5H dry cell battery. It is equipped with a clear lens, preventing absorption of light by colored glass.

For further information write to the Port Clinton Mfg. Co., Dept. C&E, Port Clinton, Ohio, or use the Request Card at page 18. Circle No. 28.

Twin finishing machine finishes 5-foot width

Its Model TW twin-bladed finisher for large-area jobs and heavy-duty slabs is available from the Whiteman Mfg. Co.

Designed to finish a full 5-foot width, the machine is said to do the work of two ordinary large finishers.

The counter-rotating trowels completely eliminate torque, making operation extremely easy, according to the manufacturer. The wide pattern is said to show up and correct irregularities instantly.

Equipped with a Wisconsin gas engine, the machine is available with standard finish or combination trowels.

For further information write to the Whiteman Mfg. Co., Dept. C&E, 13020 Pierce St., Pacoima, Calif., or use the Request Card at page 18. Circle No. 157.

LIMA

When fast mobility counts... depend on LIMA truck-mounted cranes

LIMA truck-mounted cranes guarantee you the equipment mobility you need to reduce profitless trip time between jobs. They give you, too, the *on-the-job* mobility that makes a job go faster for greater profit to you. In addition to mobility, LIMA truck cranes offer you these important benefits:

They are completely versatile . . . as a shovel, crane, dragline, pullshovel.

They are available in 6 x 4, 6 x 6, 8 x 4 and 8 x 6 carriers with capacities up to 60 tons.

LIMA truck cranes are engineered for peak performance under the most rugged conditions . . . without costly maintenance downtime.

Truly, no other machine gives you as much as LIMA. You'll know why when you investigate. Call your nearby LIMA distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corp., Lima, Ohio.

COMPARE! No other machine gives you as much as LIMA!

1. *Big capacity drums and sheaves lengthen cable life by reducing the need for double wrapping and sharp bends in cable.*
2. *All gears, smaller parts and shafts which are subject to extra wear are flame or induction hardened for longer life.*
3. *Main machinery is placed well back of center of rotation to eliminate excess counterweight.*
4. *Propel and swing gears and power take-off are enclosed in sealed oil bath for dirt elimination and smoother, quieter operation.*
5. *Anti-friction bearings, used at all important bearing points, reduce destructive friction, fuel consumption and lubrication requirements.*
6. *Travel from job to job at automotive speeds.*
7. *Torque converter (optional) automatically adjusts speed to load requirements—minimizing shock loading, making performance smoother and faster.*

Wherever you are, you can depend on skilled service and nearby warehouse stocks of parts to keep your LIMA on the job continuously.

COMPARE and you'll specify LIMA for shovels (½ to 6 cu. yds.), cranes (to 110 tons) and draglines variable.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

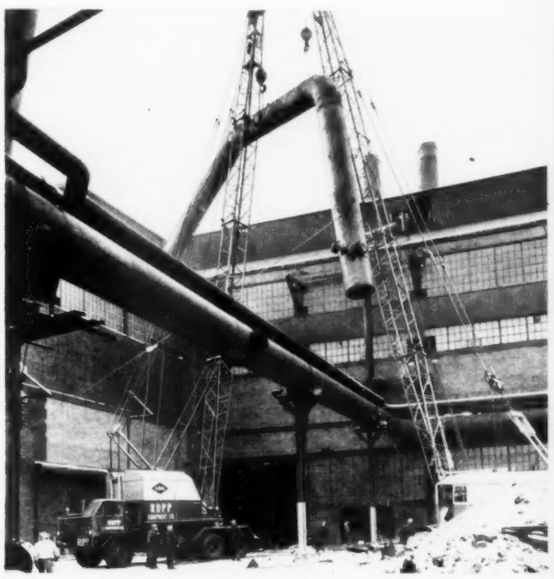
BLH BALDWIN-LIMA-HAMILTON

LIMA SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

BALDWIN-LIMA-HAMILTON

Construction Equipment Division—LIMA WORKS

OTHER DIVISIONS: Austin-Western • Eddystone • Electronics & Instrumentation • Hamilton • Loewy-Hydropress • Madsen • Pelton • Standard Steel Works



Lima Type 74-T truck crane and a Lima Type 802 crawler-mounted crane, equipped with 100′ booms, erecting a gas line at a steel plant.

Two Lima Type 54-T truck cranes, equipped with 40′ and 50′ booms, setting 31-ton, 50,000 gallon capacity tank.

Lima Type 44-T truck crane, equipped with a 90′ boom, placing concrete on a new junior high school building, Dallas, Texas.

For more facts, use Request Card at page 18 and circle No. 324

The Seaman-Gunnison utility scraper, powered by an International 650 diesel tractor modified as an 88-hp prime mover, features a scarifier-ripper attachment as standard equipment.

Utility scraper features built-in scarifier-ripper

A new utility scraper, with a scarifier-ripper built in as an integral part of the machine, is announced by the Seaman-Gunnison Corp.

The scarifier serves two purposes:

1. It can be hydraulically lowered on the back haul to rip the soil for the loading runs.
2. As a counterweight for better traction and stability.

The machine is especially designed for reducing earthmoving costs on jobs too small to justify the use of larger, more costly equipment. It also has many uses on large construction jobs, for cleanup work that cannot be done economically by large units.

Complete 180-degree turns can be made on a 22-foot roadway. Capacity is 4.5 cubic yards struck, and 6 cubic yards heaped.

Powered by an International 650 diesel tractor modified as an 88-hp, two-wheel prime mover, the unit has five speeds ranging from 2.4 to 21 mph. Maximum cutting depth is 4 inches; spread is from 2 to 14 inches; and width of cut is 7 feet. All steering and scrape controls are hydraulic.

Weight without load is approximately 16,000 pounds.

For further information write to Seaman-Gunnison Corp., Dept. C&E, 2763 S. 27th St., Milwaukee, Wis., or use the Request Card at page 18. Circle No. 169.

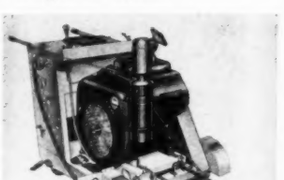
New 36-hp concrete saw for highways, airfields

A new 36-hp concrete saw, the Model C-362, for high-production sawing on highways, turnpikes, and airfield installations, is announced by the Clipper Mfg. Co. Features of the machine include dual-balance construction, one-piece frame design for precision weight distribution, and easy maneuverability.

One man lifts up, lines up, then saws. Constant, adequate weight over the blade during cutting is said to prevent riding out of the cut.

The C-362 uses a new type of self-propelling mechanism, DryTrac oilless transmission, said to give positive and accurate rear-wheel drive. The drive shaft carrying the abrasive-coated wheels is mounted on sealed, antifriction bearings for less power loss and longer life. The ball-bearing positive screw feed quickly raises and lowers the blade into the cut and provides accurate cutting depth control.

The C-362 is 135 pounds lighter than its predecessor, the Model C-360.



The new Clipper Model C-362 concrete saw is designed for high-production sawing on highways, turnpikes, and airfield pavement.

This 15 per cent reduction in weight results in much greater ease in handling, and proper design has actually increased the strength and durability of the C-362, according to the company.

For further information write to the Clipper Mfg. Co., Dept. C&E, Suite 149, 2800 Warwick, Kansas City 8, Mo., or use the Request Card at page 18. Circle No. 73.

New Optical Plummet Built into Gurley Transit Saves Set-up Time, Improves Accuracy on Windy Days

Years ago, Gurley introduced lightweight instruments to combat wind vibrations. Now Gurley further beats the wind problem with an optical plummet *built into* the instrument.

The new Gurley Optical Plummet Transit eliminates swing and sway of the cord and plumb—always time-consuming and exasperating on a windy location, and inaccurate as well. Positive accuracy of set-up is assured with the Gurley Optical Plummet.

The new Gurley transit is furnished with a tripod with built-in shifting head, and allows a two-inch shift of the instrument over the point. This provides greater latitude in initial set-up.

Gurley's new Optical Plummet Transit offers one of the advantages of the optical-reading theodolite *plus* the desirable features of simplicity and universal acceptance of the American transit. For further details, write for Bulletin OP-57.

GURLEY

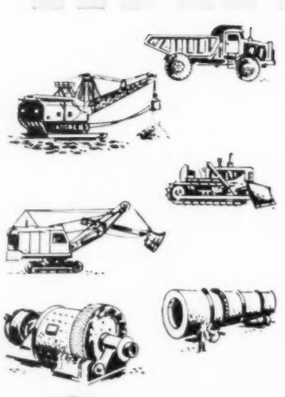
W. & L. E. GURLEY Fulton and Station Streets, Troy, N. Y.

Gurley—Since 1845

For more facts, use Request Card at page 18 and circle No. 325

WHITMORE

YOUR TOUGH LUBRICATION JOBS



World-famous Whitmore Lubricants succeed where others fail. They are lubricants, not greases. Whitmore's exclusive never-duplicated formulas stop metal-to-metal contact—put wear on the lubricants instead of on costly gears, bearings, and cables. That's why manufacturers of earth, rock, coal, and ore moving and processing equipment recommend Whitmore Lubricants to give you the service they built into your equipment.

65 YEARS OF LEADERSHIP LUBRICATING THE FOLLOWING:

OPEN GEARS, DIPPER STICKS, AND CAMS
Never-duplicated formulas that provide a hard finish impervious to moisture. Absolutely impossible for dust to cling to lubricated surfaces.

ENCLOSED GEAR CASES
Extremely high load carrying capacities for climatic conditions from the Tropics to the Arctic.

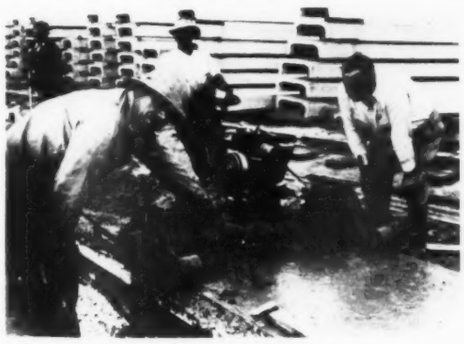
WIRE ROPE AND CABLES
Increases yardage life up to three times. Absolutely stops corrosion by penetrating to the cable core and eliminating internal friction.

Complete Line of Lubricants for Hydraulic Units, Torque Converters; Roller, Ball, and Sleeve Bearings; Speed Reducers.

Write for FREE samples, FREE data, FREE "on your job" engineering assistance.

THE WHITMORE MFG. CO.
LUBRICATING ENGINEERS
CLEVELAND 4, OHIO, U.S.A. PHONE: VULCAN 3-7272

For more facts, use Request Card at page 18 and circle No. 326



A Master 4-foot vibratory screed is being used to screed and finish Prescon channel slabs. The screed strikes off, compacts, and finishes the slab in one pass, reportedly eliminating honeycombs and cutting finishing time. According to the manufacturer, the vibration does not damage suspended beds. The screed is available in practically any length and with flat, invert, or crown beams, gas engine or electric motor driven. For further information write to the **Master Vibrator Co.**, Dept. C&E, 1752 Stanley Ave., Dayton 1, Ohio, or use the Request Card at page 18. Circle No. 99.

Offer hydraulic cutter for steel rods, bars

A new hydraulic cutter, said to be of special advantage in the prestressed field through its ability to cut with one quick bite through stressing tendons and reinforcing rods in sizes up to $1\frac{3}{8}$ inches, is announced by H. K. Porter, Inc.

The equipment consists of a lightweight portable cutterhead, a heavy-duty power pump to supply oil pressure, and a single high-pressure hose of convenient length to deliver oil to the cutterhead.

The cutterhead is equipped with a comfortable pistol grip that may be adjusted through a full 360 degrees. A small electric switch button located in the pistol grip controls the cutting action. Only light finger-pressure is required to cut capacity-size rod.

For maximum operator safety the control circuit is reduced to 12 volts. At any time during the cutting cycle the operator need only remove his finger from the control button and the cutting action will stop. Blades will immediately return to full open position.

Design features of the cutting head include extra long blades for best possible blade alignment, renewable bushings and wear sleeves at all moving points. The pump unit is equipped with a large capacity oil filter, adjustable relief valve, and a heavy-duty control valve.

The cutterheads are available with $\frac{3}{4}$, $1\frac{1}{8}$ and $1\frac{3}{8}$-inch-diameter capacity in carbon and alloy steel rods and bars; weight of the heads is 14 pounds, 40 pounds, and 105 pounds, respectively.

For further information write to H. K. Porter, Inc., Dept. C&E, 74 Foley St., Somerville 43, Mass., or use the card at page 18. Circle No. 89.

VULCAN

...the* PILE EXTRACTORS *you can depend on for

SPEED- jobs get done faster, better.

ECONOMY- efficient, balanced design, sturdy construction assures enduring economical performance.

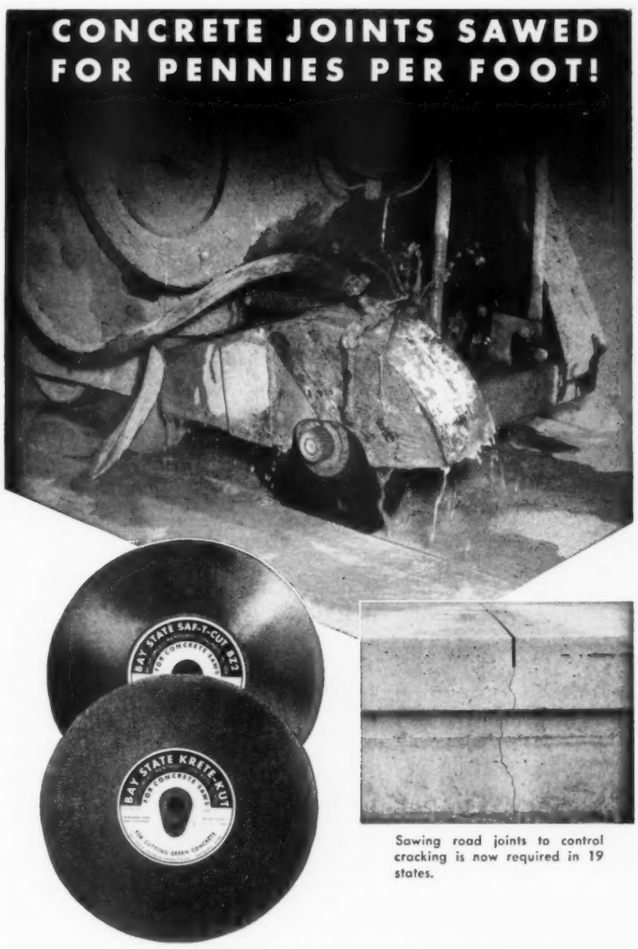
EASY OPERATION- simple in design, it is easy to operate—pulls sheet steel, wood, concrete, H-beam and pipe piles with the greatest of ease.

Manufacturers of Pile Driving Hammers and Piling Extractors Since 1852

VULCAN IRON WORKS INC. 327 North Bell Avenue, Chicago, U.S.A.

For more facts, use Request Card at page 18 and circle No. 327

CONCRETE JOINTS SAWED FOR PENNIES PER FOOT!



Sawing road joints to control cracking is now required in 19 states.

BAY STATE'S NEW REINFORCED ABRASIVE BLADES give you tremendous advantages in economy. Actual experience on both highway and airport jobs shows costs per inch foot of cut between 1½ and 6 cents, depending upon the aggregate.

Specifically designed for wet cutting in green concrete, KRETE-KUT and SAF-T-CUT BZ2 blades are available immediately in all four thicknesses normally required by contracts. The standard 14" diameter readily handles all the depths usually specified, and arbor holes are made to fit each of the popular concrete saws.

Testing KRETE-KUT and SAF-T-CUT BZ2 is the best way to get the lowest concrete cutting costs! Contact your local BAY STATE DISTRIBUTOR, or write to us in Westboro for details.

BAY STATE WHEELS of PROGRESS

BAY STATE ABRASIVE PRODUCTS CO., Westboro, Mass., U.S.A.

For more facts, use Request Card at page 18 and circle No. 328

Faster, Safer, More Economical and Look—No Wire Waste!

You save time—when you change from outmoded wire-tying methods to IDEAL reel. Get 6 to 8 more ties per minute than with clumsy, over-the-head wire coils. No chance for time-consuming tangles, bent or kinked wire. *Saves wire . . . and money, too.*

IDEAL®
tie wire reel

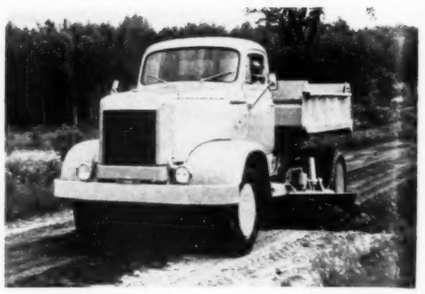
Puts wire waste to work!

Yes—IDEAL reel stops costly wire waste. *Actually puts it to work.* Gives 33⅓% more usage per pound of wire, on average. Increases tying speed 25% . . . often much more. Safeguards workers. Discover for yourself how IDEAL reel can speed your tying jobs . . . *safely* . . . and cut job costs, quickly and economically.

Write — Wire — Phone — Collect
For full details
Phone 5-7389

Ideal Reel Company 328 Harahan, Paducah, Ky.

For more facts, use Request Card at page 18 and circle No. 329



The Wausau Truckgrader is designed as a surface maintenance grader for all types of dirt or gravel roads. The unit may also be used as an ice blade and snowplow.

Multipurpose blade is grader, snowplow

A combination grader, dump truck, snowplow, ice blade, and sander is announced by Wausau Iron Works.

Designated the Truckgrader, the unit is described as a low cost surface maintenance grader for all types of dirt or gravel roads. It maintains, cuts, and crowns, and can be used to eliminate ruts, holes, and washboards from streets, roads, and other traveled surfaces—all at speeds from 6 to 20 mph.

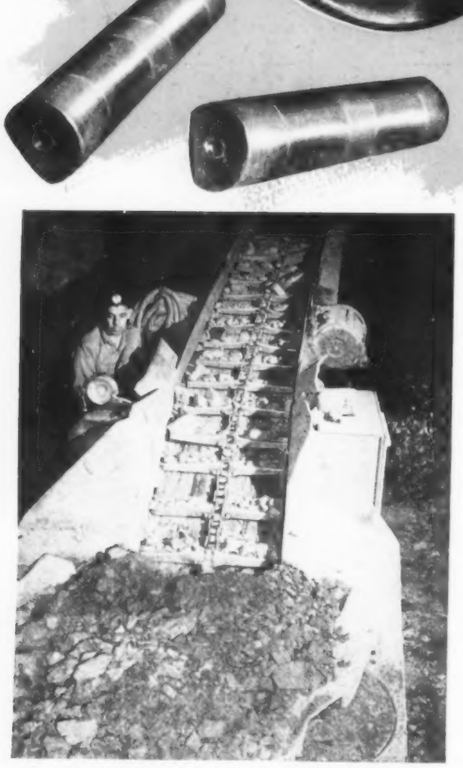
For winter use, it cuts, breaks, and removes ice and hard-packed snow. The truck can be equipped with snowplow, wings, and the Wausau hydraulic material spreader for salt, sand, cinders, chemicals, and other like materials.

Full power hydraulic control from the cab permits the operator to reverse, tilt, rotate, and lock the blade in the best operating position for all conditions.

For further information write to the Wausau Iron Works, Dept. C&E, Kramer St., Wausau, Wis., or use the Request Card at page 18. Circle No. 91.

HAYNES Alloys solve the *tough* wear problems

NO MAINTENANCE FOR 2 YEARS



Constantly and completely covered with abrasive muck. This equipment, deep in the mine, gathers and transports ore at the digging sites. Parts were hard-faced right on the job—almost 600 ft. below the earth's surface—with HAYNES STELLITE alloy No. 6 rod.

Trouble-free mining operation in abrasive muck with HAYNES Alloy

Ordinary bearings and rollers couldn't take this punishment and lasted about 3 weeks. But when these rollers were built-up and hard-faced with HAYNES STELLITE alloy No. 6, service life was extended to years instead of weeks!

Whether your equipment handles rock, sludge, or acid—where there's a serious wear or corrosion problem, you will find that a HAYNES alloy will reduce maintenance and replacement costs. For complete information about hard-facing, write for the Hard-Facing Manual. Address HAYNES STELLITE COMPANY, Division of Union Carbide Corporation, Kokomo, Indiana.

See... or *Write...* **Your local Haynes Stellite Dealer to Haynes Stellite Company**

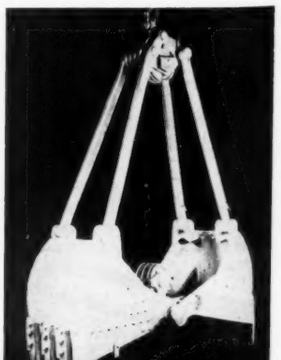
"Haynes," "Haynes Stellite" and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

For more facts, use Request Card at page 18 and circle No. 330

Fast-release clamshells offered in new line

A new line of fast-release clamshell buckets has been developed by the Hutton Fabricating Mfg. Corp. for excavating, dredging, and material-handling operations.

According to the manufacturer, the Hutton Pelican line features carefully calculated inside and outside arm lengths, which together with proper



distribution of weight and a unique pulley design result in a bucket that opens and closes with extreme speed and has exceptional digging efficiency.

The cutting teeth and cutting lip

are forged of T-1 steel, a low-carbon, quenched and tempered alloy plate steel said to combine high-yield strength (90,000 psi or more) with the extreme toughness necessary to withstand unusual impact and abrasion abuse encountered in excavating, dredging, and other operations.

The Hutton buckets feature block-and-tackle-type reeving, which keeps cables and pulleys out of contact with the material and reportedly results in longer cable and pulley life.

Both clamshell buckets and dredging buckets in any weight from light to extra-heavy, as well as specials, are offered. Buckets can be furnished with bottom teeth or with bottom and side teeth. All component parts are interchangeable in five different sizes.

For further information write to Hutton Fabricating Mfg. Corp., Dept. C&E, 2736 E. 79th St., Cleveland 4, Ohio, or use the Request Card at page 18. Circle No. 70.

Submersible sump pump turns on automatically

A submersible sump pump with an automatic switch that turns on when water rises to eight inches and shuts off when water has been completely removed is announced by the R. S. Corcoran Co.

Made of stainless steel, the unit is said to pump 3,000 gph at a 6-foot head. It stands 12 inches high, 6½ inches in diameter, and has a 1¼-inch I.P.S. discharge.

Power is supplied by a hermetically sealed Westinghouse ⅓-hp, 120-v motor, completely protected against overload.

For further information write to the R. S. Corcoran Co., Dept. C&E, P. O. Box 1404, Joliet, Ill., or use the Request Card at page 18. Circle No. 95.

Katolight Portable POWER PLANTS

With instant, dependable electrical power on the job, work speeds up . . . costs go down. Katolight Portable Plants give your crews "plug-in" electricity anywhere, whenever they want it . . . power to operate all types of electrical tools or for steady bright flood lighting. Sizes and models for every portable, standby or continuous use from 350 watts to 75 KW. Up to 500 KVA on request.

WRITE FOR NEW FOLDER ON NEW LIGHTWEIGHT PORTABLE POWER PLANTS TODAY!

KATOLIGHT CORPORATION
BOX 891-8 MANKATO, MINNESOTA

For more facts, circle No. 331

To seal several concrete hairline cracks in the upper-level pavement outside a large industrial plant, the Arid Corp., Baltimore, Md., employed a Black & Decker 8-inch saw with abrasive disk for cutting a preliminary groove 2½ inches deep in 4,500 psi concrete. A Black & Decker 2-inch hammer was then used to remove the concrete between the grooves, prior to applying a waterproofing compound. For further information about these portable electric hammers and saws, write to the **Black & Decker Mfg. Co.**, Dept. C&E, E. Pennsylvania Ave., Towson 4, Md., or use the Request Card at page 18. Circle No. 117.

Chicago Construction Company Reports . . .

This Anthony Frameless Trailer Hauls One Extra Ton Per Load!

IT'S NO SECRET!
The Teleramic "V" Seal Hoist Is A Major Factor In Frameless Trailer Success

Proven "V" seal packing is only one of many quality features in the Teleramic Hoist design. Because the dry operating "V" seal is self-adjusting, repacking or manual adjustment of the Teleramic cylinder is very rarely needed. "Truss rings" encircle and reinforce the ends of each cylinder tube to prevent "flaring." Extra long bronze bearings and long overlap of the cylinders help keep them perfectly aligned.

During a 17-week test period of steady rock hauling; this Anthony Frameless Trailer proved itself *better in performance and more profitable to operate* than similar equipment used on the same jobs. This was the report from Consumers Company of Chicago, Illinois, which is currently using this Anthony Frameless Trailer on major paving jobs in the Chicago area. Here are the conclusions they reached after a careful study of the facts:

1. Anthony Frameless Trailers (lighter than similar hauling equipment) carry at least 1 extra ton in each payload over standard equipment.
2. In all other hauling and dumping operations, Frameless Trailers equal or exceed similar hauling equipment.
3. It is almost impossible to get bogged down with an Anthony Frameless Trailer. If the trailer is stuck, the driver sets his tractor brakes and raises the Teleramic Hoist. If the tractor is stuck, the driver sets his trailer brakes and lowers his Teleramic Hoist.

Buy The Dump Body That Has The Service

Over 100 Anthony Distributors are located nationwide. At least one is convenient to you . . . ready to give immediate service on all Anthony equipment.

Complete descriptive literature is now available on Anthony Frameless Dump Trailers and Teleramic Hoists. No obligation, of course!

Just write to: 1754 Baker Street

ANTHONY COMPANY • Streator, Illinois

For more facts, use Request Card at page 18 and circle No. 332

This Economy mobile utility building is 7½ feet wide and 16 feet long. It is demountable from its carriage or is available without undercarriage, complete with floor.

Offer mobile building for construction sites

A mobile, 7½×16-foot construction building is available from Economy Buildings, Inc.

Designed for field office, storage, tool shed or workshop, the unit is built of kiln-dried, tongue-and-groove lumber and mounted on a heavy-duty steel undercarriage. It is delivered ready to roll, complete with sash, door, all hardware, and prime-coated exterior.

The building is demountable from its carriage or is available without undercarriage, complete with floor. The trailer is equipped with tires, as well as electric brakes controlled by the driver.

For further information write to Economy Buildings, Inc., Dept. C&E, P. O. Box 367, West Chicago, Ill., or use the Request Card at page 18. Circle No. 2.

Offer new cold process asphalt roofing compound

A new cold process asphalt roofing compound is announced by The Panther Co.

The new compound is designed for application, particularly, to concrete tilt-up buildings with concrete roofs, or to other buildings with roof decks of steel, wood, corrugated sheet metal, roofing felt, gypsum, plywood, and other material.

Aging in the compound is said to proceed much more slowly than in conventional asphalt roofing. It is also said to be soft under ordinary circumstances and possess a high degree of ductility.

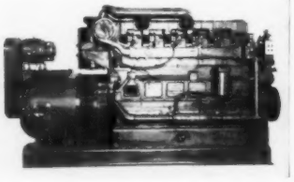
An important characteristic stressed by the manufacturer is the product's ability to adhere to surfaces wet with water. The material reportedly can be applied even if the surface is saturated. No heat is required to treat it before application—it is applied in the form in which it is shipped.

For further information write to The Panther Co., Dept. C&E, 840 N. Main St., Fort Worth, Texas, or use the Request Card at page 18. Circle No. 98.

New Turbodiesel engine rated at 450 horsepower

Its new Model LRT-6 Turbodiesel engine for use in pumping units, shovels, and electric power generation is announced by the Cummins Engine Co., Inc.

The engine is said to use normally wasted energy of exhaust gases, by means of a turbocharger, to develop



additional horsepower. A turbine, located in the exhaust system, drives a centrifugal blower in the air intake system. By forcing a greater weight of air into the cylinders, more fuel can be burned completely and more power developed, it is stated.

The LRT-6 has a rating of 450 horsepower at 1,100 rpm and has a displacement of 2,477 cubic inches. It is a 6-cylinder engine equipped with a Cummins T-590 turbocharger and has the Cummins PT (pressure-time) fuel system. The PT principle of fuel metering utilizes a fixed size opening in a simple injector and variable pressure to meter the fuel charge.

The engine is 136 1/16 inches long, 53⅝ inches wide, and 86⅛ inches high. It weighs 12,100 pounds.

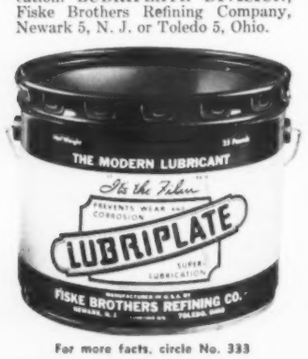
For further information write to Cummins Engine Co., Inc., Dept. C&E, Fifth and Union Sts., Columbus, Ind., or use the Request Card at page 18. Circle No. 88.

LUBRIPLATE
Nos. 130-AA, 630-AA and 930-AA
are grease type lubricants especially formulated for use in bearings and on other machine parts subject to heavy loads. Have extremely high film strength, marked adhesiveness and water repellence.

LUBRIPLATE
Nos. 4 and 8
are most satisfactory fluid type lubricants over a wide range of temperatures. Due to their high film strength, they are ideal for use where heavy loads are encountered.

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Write for free "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. LUBRIPLATE DIVISION, Fiske Brothers Refining Company, Newark 5, N. J. or Toledo 5, Ohio.



For more facts, circle No. 333

*Lightweight, portable air-cooled engine drive

AC Power—AC Welding anywhere!

No contractor can afford to be without this valuable 2-in-1 unit that gives you welding current anywhere for maintenance, repair and construction—and with a flip of the switch gives you 110 volt AC current for tools, lights, motors. Your own men can use—you save hundreds of dollars by doing your own repair work—by having current available for welding or power when and where you need it. Coupon brings complete information—no obligation.

Cut costs—save hundreds with this lightweight portable welder. Save on replacement parts. Avoid costly delays and down time. You make repairs right on the job.

HOBART BROTHERS CO. Box 897. Troy, Ohio, Ph. FEderal 2-1223.
Without obligation, send complete information on the equipment I've checked below.
_____amp. capacity ☐ Arc Welder with 110 v. auxiliary power ☐ Husky Boy Air-Cooled Arc Welder ☐ 250 amp. Water-Cooled Welder ☐ Standard Water-Cooled Gas Drive.
Name_____Position_____
Firm_____
Address_____

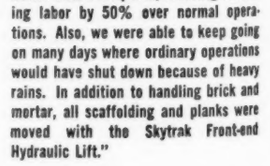
HOBART "One of the world's largest builders of arc welding equipment"

For more facts, use coupon, or Request Card at page 18 and circle No. 334

This West SKYTRAK "445" is "on-the-job" at the Dow Chemical Company's new Administration Center, Freeport, Texas, for the Herman L. May Masonry Co., of Houston... proving its versatility and ability to cut costs.

Mr. May, owner of the "SKYTRAK" states:

"We are well pleased with the West Equipment — it has worked out much better than anticipated, reducing attending labor by 50% over normal operations. Also, we were able to keep going on many days where ordinary operations would have shut down because of heavy rains. In addition to handling brick and mortar, all scaffolding and planks were moved with the Skytrak Front-end Hydraulic Lift."

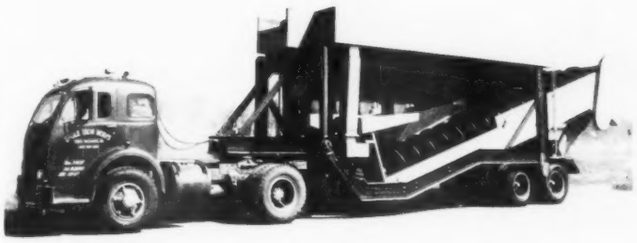


FOR COMPLETE DETAILS . . . CALL OR WRITE

WEST
BRICK BUGGY CORPORATION
4310 Mayfield Road Cleveland 21, Ohio
Phone: EVergreen 1-9468

For more facts, circle No. 335

Offer complete, portable sand-processing unit



This portable washing-classifying-dehydrating unit for specification sand, available from the Eagle Iron Works, can travel the highways from pit to pit. Setup time on the job site is about one hour.

A complete sand washing-classifying-dehydrating assembly on wheels is available from the Eagle Iron Works.

The new units consist of a water scalping-classifying tank with automatic bleeder valves and 3-cell collecting-blending flume, and two single screw washer-classifier-dehydrators. The entire assembly is compactly mounted on a chassis, for use with a semi-tractor. Size and weight permit highway travel from pit to pit, according to the manufacturer, with the unit capable of being hauled right into the pit and positioned next to a crushing and screening plant.

Side flares on the washers can be quickly removed for travel, and when the site is reached the section can be set up for operation in approximately one hour, the company reports.

Simple manual control of metering "splitter" gates on the tank in conjunction with the 3-cell flume is said to adapt the unit to a variety of pit conditions. Both screws can be used to produce one product, or a different gradation can be produced with each screw. Capacities range up to 200 tons per hour.

The unit is available with gasoline engine or electric power.

For further information write to Eagle Iron Works, Dept. C&E, 159 Holcomb Ave., Des Moines, Iowa, or use the Request Card at page 18. Circle No. 170.

Announce new air-powered de-clutching system

A new air-power de-clutch for models R-46, R-96, and R-960 Road-Ranger transmissions is announced by the Transmission Division of the Fuller Mfg. Co.

The system is used for releasing and engaging the clutch while the vehicle is in forward motion, without the use of a clutch pedal or the addition of any substitute action or motion on the part of the driver. Complete release and re-engagement of the clutch, as well as double clutching, is accomplished automatically at the appropriate time and in the normal course of moving the shift lever for gear engagement.

Operating from the vehicle air system at full line pressure, the power de-clutch employs only a pilot valve, relay valve, and air cylinder connected by the required lines, hoses, fittings, and clutch linkage.

The new power de-clutch may be employed in all shifting situations where the vehicle is in forward motion. It may also be used to release the clutch before starting the vehicle; however, the clutch pedal must be used to engage the clutch as the vehicle is put in motion in either forward or reverse direction.

For further information write to the Fuller Mfg. Co., Transmission Div., Dept. C&E, Kalamazoo, Mich., or use the Request Card at page 18. Circle No. 119.

WIRE ROPE AT WORK

The Roy C. Smith Bridge over the Neponset River, near Milton, Massachusetts, is an important link in Greater Boston's expanding new system of expressways. Because of its high level, this streamlined bridge is the only Neponset River crossing between Milton and the Bay that is not subject to navigational openings.

Construction involved the placing of some heavy plate girders, and the photograph shows one of them being lowered into position. The girder is 106 ft long and weighs approximately 34 tons. Handling of the load was entrusted to strong, flexible Bethlehem wire rope, Purple Strand grade—a top-quality rope that makes even the touchiest jobs seem routine.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:
CONSTRUCTION • EXCAVATING • MINING • QUARRYING • PETROLEUM • LOGGING • MANUFACTURING

BETHLEHEM WIRE ROPE
BETHLEHEM STEEL

For more facts, use Request Card at page 18 and circle No. 336

Featuring a cutting width of 100 inches, this Ford rotary cutter is designed for use with all drawbar and power-takeoff tractors of three-plow or greater power. The cutting height can be adjusted from 2 to 11 inches above ground level by a linkage system that raises or lowers the implement's two gage wheels. Regardless of the cutting height, the entire unit remains parallel to the ground. For further information write to the Tractor & Implement Div., **Ford Motor Co.**, Dept. C&E, 2500 E. Maple Road, Birmingham, Mich., or use the Request Card at page 18. Circle No. 121.

Kit eliminates high altitude power loss

The reduction of engine horsepower caused by operation at high altitudes can now be eliminated on the Caterpillar D8 tractor by the use of a normalizing kit available from the Caterpillar Tractor Co.

The new kit, which consists of a turbocharger and all manifolds and adaptors needed to mount it on the tractor engine, overcomes the cause of high altitude power loss—insufficient oxygen to permit complete combustion of fuel.

The turbocharger delivers air to the inlet manifold at greater than atmospheric pressure, thus permitting complete fuel combustion and restoring "sea level" horsepower up to an altitude of 10,000 feet. For example, when operating at an altitude of 8,000 feet, the normalized D8 will operate at the machine's sea level rating of 191 horsepower, while the standard D8's capacity at the same altitude would be 151 horsepower.

The normalizing kit does not increase the sea level horsepower of the tractor, but serves only to provide the needed oxygen to burn the same amount of fuel at high altitudes as at sea level.

The kit is available either for factory installation on new D8 tractors, or for field installation on machines already in operation.

For further information write to the Caterpillar Tractor Co., Dept. C&E, Peoria, Ill., or use the Request Card at page 18. Circle No. 102.

Cambered double-tee form for precast slabs

Its Atlas cambered double-tee form, a precision form that is completely portable and eliminates the need for long line casting beds and expensive equipment, is available from the Irvington Form & Tank Corp.

According to the manufacturer, the forms can be installed in a small area and are readily moved about. Setup is simple, lightweight concrete (3,750 psi) is used, and production of one cast per day may be obtained. With steam curing, two casts per day reportedly can be made. Economical manufacture is further promoted by the fact that it is possible to produce castings that require no finishing.

The forms are designed to eliminate problems of excessive camber, with molds precisely cambered to compensate for dead load, plastic flow, and shrinkage. No depressing devices are employed.

Each form consists of three members: pan, cradle, and bulkhead. The Atlas system of employing an individual mold with standard steel reinforcing provides adaptability for handling special widths, daps, welding plates, and other variations.

Standard sizes provide for 4-inch tees having depths of 10, 12, or 16 inches, with lengths ranging from 27 feet 6 inches to 42 feet. Special lengths and sizes are made to order.

Filler channels are available in 2-

VITAL INGREDIENT FOR TUNNEL CONSTRUCTION

You can't see it, but you couldn't build tunnels without fresh air to sustain life underground.

That's why contractors depend on ventilating lines like these made up of Naylor Spiralweld pipe—the one light-weight pipe with the exclusive spiral-lockseam structure that assures strength and safety with economical performance.

Naylor pipe is light in weight. It speeds handling and installation. Naylor pipe is strong. Has what it takes for push-pull ventilation. Naylor lines can be made up quickly—especially with the one-piece Naylor Wedgelock coupling that can be connected with only one side of the pipe in the open.

Keep in mind, too, that the Naylor structure permits the use of lighter gauge material without sacrifice of strength—a factor that adds to the over-all economy of this distinctive piping.

Write for Bulletins No. 507 and No. 514.

NAYLOR

NAYLOR PIPE COMPANY
1270 East 92nd Street, Chicago 19, Illinois

Eastern U.S. and Foreign Sales Office:
60 East 42nd Street, New York 17, New York

For more facts use Request Card at page 18 and circle No. 337

Available in lengths to 42 feet, Atlas cambered double-tee forms are designed to eliminate problems of excessive camber with no depressing devices necessary.

inch increments to block molds to shallower depths for the casting of slabs suitable for non-exposed work. However, separate pans are recommended for the production of architecturally acceptable slabs.

For further information write to the Irvington Form & Tank Corp., Dept. C&E, Dept. 1C, 20 Vesey St., New York 7, N. Y., or use the Request Card that is bound in at page 18. Circle No. 127.

Self-propelled tamper rides paving form

The new Universal Formpacker, manufactured by the Western Form & Iron Co., is said to save time and labor costs in compacting soil beneath paving forms to insure perfect form alignment.

The new, self-propelled unit compacts soil under both sides of the form at the rate of approximately 25 fpm. It adjusts to fit all standard forms from 8×8 inches to 12×12 inches. Longer machine life and lower maintenance costs are said to be assured by such components as roller-bearing connecting rods, hardened tampers, a heavy-duty Dodge clutch, sturdy, adjustable handlebars, ball bearings on all main friction points, and an easily replaceable engine V-belt.

The Formpacker is available in both left and right-hand models, permitting contractors to operate one machine on each side of the road ahead of the paving spread.

The self-propulsion feature is reported to eliminate operator fatigue and to produce a tamping job superior to that achieved with old hand-tamping methods.

For further information write to Western Form & Iron Co., Dept. C&E, 1301 Washington Ave. S., Minneapolis, Minn., or use the Request Card at page 18. Circle No. 82.

The Universal Formpacker compacts soil under both sides of the form.

Announcing the NEW SAFE-T-FLARE TRANSISTOR ECONO-FLASHER BARRICADE at AMAZING LOW COST

Head of rugged plastic
Light stays on longer
CAUTION
Sturdy steel 30" panels CAUTION Reflectorized. Other side striped yellow with black. Strong angle iron legs fold for easy transportation.
Standard Head $19.95

EXTRA LARGE DELUXE HEAD. 28" lens area. Incandescent brilliancy. Rotates 90°. Exclusive theft-proof mounting.

NO MOVING PARTS
State Highway Department lab tests show Econo-Flasher stays on 5 TIMES LONGER — 30% BRIGHTER THAN ANY FLASHER TESTED.

HERE'S GOOD NEWS FOR CONTRACTORS, BUILDERS, MUNICIPALITIES!

Now the new SAFE-T-FLARE TRANSISTOR ECONO-FLASHER BARRICADE is in full production. It operates under all conditions on tiny, yet powerful transistors. Sealed in power supply guaranteed two years. Water-proof. Low cost!

Model SF 1000B complete with standard head **$29.95** (Battery extra)

Light and other parts may be ordered separately, at low prices. Quantity prices supplied on request.

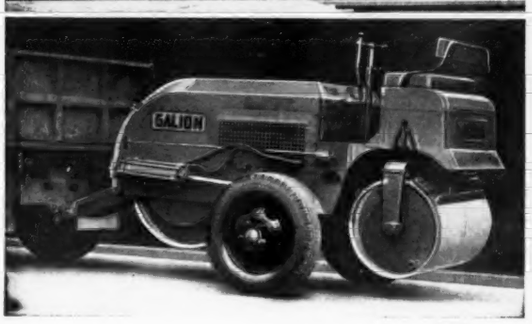
(Rental policy on original Twin Flasher Barricade still available on same economical basis).

WRITE • WIRE • PHONE ORDER for IMMEDIATE DELIVERY
(Samples on Request)

SAFE-T-FLARE CORP. 2005 Armour Rd., North Kansas City, Missouri, Victor 2-1329

For more facts, use Request Card at page 18 and circle No. 338

GALION 3-5 and 4-6 TANDEM and PORTABLE ROLLERS



SMALL ENOUGH FOR *Economical Maintenance*

LARGE ENOUGH FOR *Many Surfacing Jobs*

All of these rollers have 4 cyl. 25 h.p. engines, 48" diameter, 42" wide compression rolls, hydraulic steering, and straight line spur gear final drives.

TANDEM ROLLER
This 3-5 Ton Variable Weight Tandem Roller is easy to operate and maneuver. You'll find it profitable on new construction, maintenance and repair work.

PORTABLE ROLLER
Easily towed by truck from job to job. Widely used for patch work, rolling drives and parking lots, resurfacing of secondary roads, etc. Variable weight from 7,100 lbs. to 9,765 lbs.

RETRACTABLE WHEEL TANDEM ROLLER
A 4-6 Ton Variable Weight Roller that you can tow to jobs speedily and safely. Hydraulically operated retractable wheels with heavy-duty pneumatic tires quickly raise the complete roller off the ground when hitched to a truck.

Write for literature

OTHER GALION Variable Weight ROLLERS

3-AXLE TANDEM ROLLER
14-20 Ton

2-AXLE TANDEM ROLLERS
5-8, 8-10½, 8-12, and 10-14 Ton

"CHIEF" 3-WHEEL ROLLERS
4 Sizes-10 to 16 Ton
(Also available with spoke-type rolls)

"WARRIOR" 3-WHEEL ROLLERS
2 Sizes—7 to 10 Ton
(Also available wth spoke-type rolls)

All the above rollers are equipped with ROLL-O-MATIC Drive as STANDARD EQUIPMENT.

TRENCH ROLLER
8785 to 10220 lbs.

ESTABLISHED GALION 1907

TRENCH ROLLERS · PORTABLE ROLLERS · 3-WHEEL ROLLERS · TANDEM ROLLERS · MOTOR GRADERS

THE GALION IRON WORKS & MFG. CO., General and Export Offices, Galion, Ohio, U.S.A.
Cable address: GALIONIRON, Galion, Ohio

For more facts, use Request Card at page 18 and circle No. 339

The Sasgen Liftamatic will transport 1,200-pound loads to heights of 90 feet at a speed of 75 fpm.

Mobile material elevator lifts to 90-foot height

A portable, automatic elevator which reportedly makes easy work of transporting materials from ground level to heights of 90 feet is offered by the Sasgen Derrick Co. Either steel or aluminum models are available, and either gasoline-engine or electric-motor power may be specified.

The new Liftamatic elevator is available in models which will handle 1,200-pound loads at the rate of 75 fpm, according to the manufacturer.

Limit stops on the elevator permit stopping the platform at any predetermined level. Safe operation is assured by a reportedly fool-proof slack-cable brake which will stop a fully loaded platform immediately on all steel models. Dual speeds and lifting capacities may be obtained through single or two-part reeving of the steel hoisting cable.

The elevator is equipped with large, pneumatic-tired wheels, and optional equipment includes a 7-cubic-foot dumping bucket which bolts to the platform.

For further information write to the Sasgen Derrick Co., Dept. C&E, Dept. CON, 3101 W. Grand Ave., Chicago 22, Ill., or use the Request Card at page 18. Circle No. 79.

New mobile generator

An adaptable new generator said to develop 110 volts-1,200 watts ac, and up to 70 amps dc, is announced by Kurland Motors.

Designated the Combinator, the unit will operate electric tools and appliances of all kinds, and is designed to replace the ordinary generator, using the same brackets, in any truck. Tools are plugged in to a control panel attached to the dashboard.

The unit operates from the fan belt, giving instant response while the engine idles. It is said to be easily installed and completely safe, with standard connections and wiring.

For further information write to Kurland Motors, Dept. C&E, 1134 Broadway St., Denver 3, Colo., or use the Request Card at page 18. Circle No. 179.

Rod and target features special clamping device

A new engineers' and builders' rod and target, made of three pieces of selected, seasoned magnolia wood which is light, strong, and will not warp, is announced by the David White Instrument Co.

Each section is highly polished with a natural finish and is 2¼ inches wide, 1⅛ inches thick and 5 feet long. The rod has a 14-foot working surface when fully extended.

Graduations on the rod are large and easy to read, in feet, inches, and eighths, on replaceable tape. The curved surface of the white face prevents reflections. Foot numbers are in red, and inches in black.

The unit extends easily and locks in any desired position with a specially constructed bracket set within the rod. According to the manufacturer, this internal clamping device not only makes the rod easier to slide

REMOVING FORMS FROM COMPLETED PIERS, Fruin-Colnon maneuvered their American 300 Series Truck Crane over temporary fill in the Missouri River. The complete project will require nearly 40,000 cubic yards of concrete and 16,000,000 pounds of steel! Total cost, including the approaches, will be $13,500,000.

BUILDING MISSOURI'S LONGEST BRIDGE

American Truck Crane With 105-Foot Boom Used On Approach Project

An $8,500,000 bridge spanning the Missouri River near St. Charles, Mo., is the longest bridge ever built in the state. It is four lanes wide, 4,082 feet long!

Fruin-Colnon Contracting Co., St. Louis, is building the 10-pier west approach substructure. The contractor used an American 300 Series Truck Crane equipped with a 105-foot boom. The 25-ton American easily reached to the top of the piers for the many lifting jobs required. Fruin-Colnon is also using this American on expressway projects in St. Louis.

Contractors who shuttle truck cranes from job to job know that profits depend on "working" time. Travel and set-up time is non-profitable! It's an American Truck Crane's ability to finish a job and roll out on the highway in the shortest time that counts. Here's why they roll sooner: They fall within highway limits in width and weight in most states —special permits aren't needed. When it's necessary, the counterweight can be removed with the crane's own power and placed on a truck for hauling. The stronger, lighter weight pipe-laced boom features pin connections that speed up assembly-disassembly. And the 300 Series will easily raise 100 feet of boom plus 30 feet of jib right from the ground without help! If you're interested in all 'round profitable truck crane operation, see your American Distributor!

as well as firmly locking it at the desired height, but eliminates outside obstructions, making it smooth and easy to carry.

The reversing die cast target, 6 inches in diameter, moves smoothly up and down the rods and may be clamped easily to the rod.

For further information write to the David White Instrument Co., Dept. C&E, 2501 N. 19th St., Milwaukee 5, Wis., or use the Request Card at page 18. Circle No. 114.

When not engaged in moving equipment, this convertible wheeled dolly, for use with LeTourneau-Westinghouse Model C Tournapulls, can be transformed into a 2-ton mobile utility crane.

New scraper accessory is dual-purpose tool

A unique new accessory for use with LeTourneau-Westinghouse Model C Tournapulls is announced by the Reisser Corp. It is a convertible wheeled dolly which quickly attaches under the nose of the C size prime mover to bring the unit within legal axle limits for fast job-to-job movement over the highway.

The unusual feature of the unit is the convertibility which makes it a dual-purpose tool.

On arrival at the job, instead of being removed and laid aside to stand idle until the next equipment move, the dolly is easily transformed into a two-ton mobile utility crane. Hitched behind a panel or pick-up truck, it can handle any of a wide variety of hoist and carry assignments.

Featuring a simple three-point hookup, the dolly reportedly can be attached to the prime mover in less than 10 minutes. All connections are made without the need for special tools, crane, or jacks.

The amount of weight transferred from the drive wheels of the Tournapull to the dolly wheels is easily adjustable to meet variations in legal requirements. Inserting shims behind the big compression springs on the dolly increases the amount of weight carried on the dolly wheels.

These springs, cushioning shock to give the operator a smooth ride at high speeds, also provide a knee action effect which keeps weight transfer nearly constant, regardless of the condition of the road.

The dual-wheel assemblies of the dolly are mounted on large, tapered roller bearings which permit them to caster freely, thus allowing full maneuverability to the rig. Large cross section tires (7.50×10—10 ply) on each caster wheel have more than enough capacity to support the transferred weight even at top speed.

When the project is reached, conversion of the dolly to its role as mobile "stiff leg" crane is said to be quick and easy.

As a utility crane the dolly can be used for many jobs around the equipment yard or in the field. Typical applications include tire changing and such maintenance work as handling the removal and replacement of equipment components.

For further information write to the Reisser Corp., Dept. C&E, P. O. Box 362, Blair, Nebr., or use the Request Card at page 18. Circle No. 97.

DENING U.S. HIGHWAY 40 is one of ...in-Colnon's jobs on the St. Louis Ex...sway. Others include building a clover...f interchange, a bridge and a twin box ...rert! Excavating for new pavement, ...in-Colnon uses an American 100 Series ...khoe. This ½-yard machine, latest addi...n in the American line, offers really low ...rall operating cost—and a low initial ...t, too. For a top-dollar value check the ...ny advantages of this rugged new ...k or crawler mounted American!

TO EXCAVATE AN OLD BUILDING FOUNDATION, J. Gallo Limited, Toronto contractor, used his American 700 Series Backhoe. The rugged construction of this crawler withstands the pounding of tough jobs like this—virtually eliminates unscheduled downtime! The high performance design plus smooth acting air controls boost hourly output—cut the cost per yard on every job! On rubber, this machine has a rated lifting capacity of 50 tons. Your American Distributor has complete details on this big series—visit him soon!

...OSING THE GAP WITH A 290-TON ...DER SECTION was done on this turn...job with four American stiffleg derricks, ...h rated at 115 tons lifting capacity, ...ered by American hoists, American guy, ...ffleg, steel erector and barge mounted ...cks perform outstanding lifting jobs ...very industry. They're the backbone of ...erican Crane design know-how—the big ...ne design that pays off on every job!

...CRANE THE RIGHT SIZE FOR YOUR ...B is available from American Distrib...rs everywhere. This complete line offers ...ket capacities from ½-yard to 2 yards, ...ng capacities up to 50 tons! Your Dis...utor is trained to help you choose the ...er type of power, boom length, jib, ...nterweights—give you expert advice on ...many decisions that have to be made ...the time of purchase! And you'll find ...ck service facilities are available from ...r American Distributor too. See him for ...plete crane details and his part in the ...n and service of American Cranes!

AMERICAN HOIST
and Derrick Company
Saint Paul 1, Minnesota

For more facts, use Request Card at page 18 and circle No. 340

The Spotter-Base, a new unit added to the Highway Trailer Co.'s line of skid-mounted earth-boring machines, permits the auger to dig at any point within a 12-foot-square area without moving the truck.

Device aids positioning of earth-boring machines

The Spotter-Base, a hydraulically operated device said to position earth-boring units faster and more easily in digging operations, is available from the Highway Trailer Co. for use with its line of skid-mounted earth-boring machines.

The new unit "spots" the hole, thereby eliminating the necessity of constant maneuvering of the truck into position for the digging or pole-setting operation. With the spotter the operator can reach over digging obstructions such as large rocks and can shift digging direction should an underground obstacle be encountered.

Fingertip controlled hydraulic positioning allows the operator to swing the boring machine 80 inches laterally and extend the unit 22 inches from the platform. The boring machine will dig at any point within this 12-square-foot area without moving the truck. A hydraulic positioning ram controls auger travel across the rear of the truck body.

The Spotter-Base can be mounted on a single axle or tandem truck.

For further information write to the Highway Trailer Co., Dept. C&E, 405 E. Fulton St., Edgerton, Wis., or use the Request Card at page 18. Circle No. 105.

Mobile concrete batcher has 20-cubic-foot drum

A completely new and self-sufficient mobile concrete mixer is announced by the Good-All Electric Mfg. Co.

Designated Drive-A-Mix, the unit is self-propelled through a 26.8-hp engine. It travels easily over hilly terrain and through mud and loose gravel, according to the manufacturer, a low center of gravity making it tip-safe.

Highly maneuverable, the unit has a tricycle steering design that permits a complete 360-degree turn in a 15-foot circle.

Drive-A-Mix is equipped with a 20-cubic-foot mixing drum and carries its own water supply. Normally, five loads can be mixed without re-filling, the manufacturer reports.

This versatile mixer is only 7 feet 8 inches high, 74 inches wide, and 11 feet 6 inches long. Its gross weight is 3,460 pounds.

For further information write to the Good-All Electric Mfg. Co., Dept. C&E, Good-All Bldg., 120 First St., Ogallala, Nebr., or use the Request Card at page 18. Circle No. 171.

With the Drive-A-Mix mobile concrete batcher, two men can mix and deliver 20 cubic feet of concrete every four or five minutes. A unique tricycle steering design makes the unit highly maneuverable, able to overcome most obstacles at construction sites.

New dump body has rugged underbody construction

Its new HMT-11 dump body is announced by The Heil Co.

Specifically designed for use with Heil HMT 63-102 or HMT 63-117 head-mount telescopic hoist, the new unit features interlaced cross-mem-

NEW
FAST-APPROACH HYDRAULIC PUMP
for pipe benders, rams, jacks, and other tools

two-speed action saves time, money

The new GREENLEE No. 798-AC-SA Hydraulic Power Pump operates GREENLEE pipe benders *three to five times faster* than a hand pump and increases speed of other hydraulic tools comparably. Exclusive GREENLEE fast approach, with automatic change-over to lower speed high-pressure drive, eliminates costly waiting time, makes numerous jobs go faster and easier. Electric motor-driven pump develops 6,000 psi continuous pressure, up to 10,000 psi intermittent. Same performance available in ac-dc and gasoline motor models.

GREENLEE Send coupon

GREENLEE TOOL CO.
2269 Columbia Ave.
Rockford, Illinois
Please send illustrated Bulletin E-223 on Greenlee No. 798-AC-SA Portable Hydraulic Power Pumps.

NAME _____
COMPANY _____
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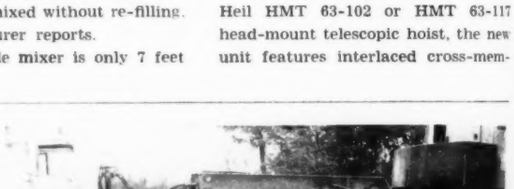
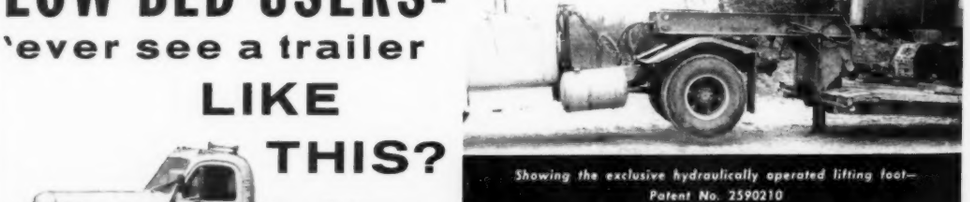
CITY AND STATE _____

For more facts, use coupon or circle No. 341

LOW BED USERS-
'ever see a trailer
LIKE
THIS?



Showing the exclusive hydraulically operated lifting foot—Patent No. 2590210



ROGERS HYDRAU-LIFT *Hydraulically-Operated* DETACHABLE GOOSENECK TRAILER

CAN YOU unload, reload and be moving again in as little as 3 minutes ?

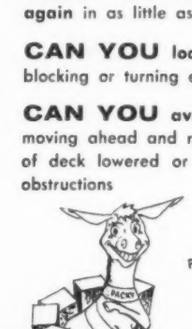
CAN YOU load from the front without using blocking or turning equipment on deck ?

CAN YOU avoid detouring or unloading, moving ahead and reloading by traveling with front of deck lowered or raised to pass under or over obstructions ?

CAN YOU discharge overhanging loads by raising deck, blocking up load, lowering deck and pulling trailer out ?

CAN YOU raise trailer wheels to change tires or wheels of tractor while attached, to service tire or install chains ?

CAN YOU carry dippers, bulldozer blades, etc., on an unobstructed gooseneck ?



PACKY SAYS: It's almost like sitting down and letting the load slide off your back.

YOU CAN handle these operations and more with this new ROGERS Gooseneck Trailer. No winch is required saving up to $900 in cost and up to 1000 pounds in overall weight. Write for illustrated literature.

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ORCHARD STREET • ALBION, PENNA.
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For more facts, use Request Card at page 18 and circle No. 342

The Heil HMT-11 dump body is designed for use with the firm's HMT 63-102 or HMT 63-117 head-mounted telescopic hoist.

ber underbody construction. With the body floor welded both to the top of the cross-member and the long channel, distortion and floor sag are said to be virtually eliminated.

The body has high-tensile steel construction throughout. The tailgate is reinforced on all edges with rugged box-section members, and has heavy-duty steel plate hinges.

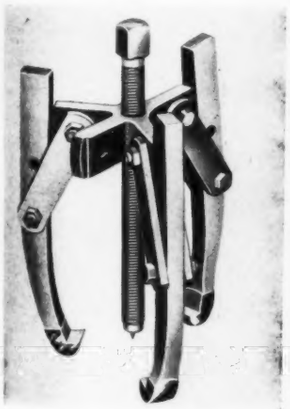
According to the manufacturer, the unit is relatively lightweight for larger legal payloads.

For further information write to The Heil Co., Dept. C&E, 3003 W. Montana Ave., Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 125.

Announce combination 2-jaw or 3-jaw puller

A single jaw puller with a choice of two or three gripping points is offered by the Owatonna Tool Co.

The combination puller can be changed from 2-jaw to 3-jaw by simply shifting one jaw and adding another, affording the advantage of

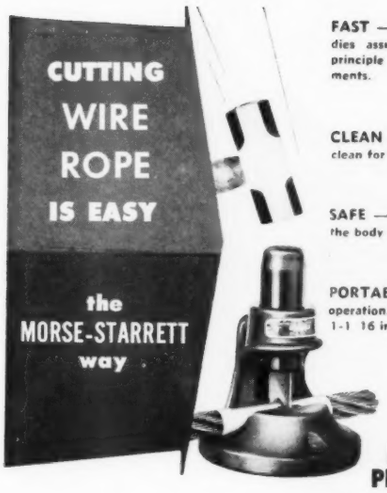


six puller sizes with only three puller heads, according to the manufacturer.

The new puller incorporates the firm's power pitch thread, said to increase power up to 32 per cent. The jaws are designed to grip tighter when more pressure is applied.

The unit is available in sizes from 6 tons through 14 tons capacity.

For further information write to the Owatonna Tool Co., Dept. C&E, 381 Cedar St., Owatonna, Minn., or use the Request Card at page 18. Circle No. 4.



FAST — Especially designed cutting blade and dies assures fast cutting action. The hammer principle eliminates any special skill requirements.

CLEAN — Wire rope ends are cut smooth and clean for perfect threading or splicing.

SAFE — The enclosed cutting blade locked in the body of the cutter assures perfect safety.

PORTABLE — Models for tool kit or stationary operation. With cutting capacities up to: 1 inch, 1-1 16 inch, 1-1 2 inch.

SEE YOUR DEALER OR WRITE DEPT. "B"

MORSE-STARRETT PRODUCTS COMPANY
1204 - 49th AVENUE, OAKLAND 1, CALIF.

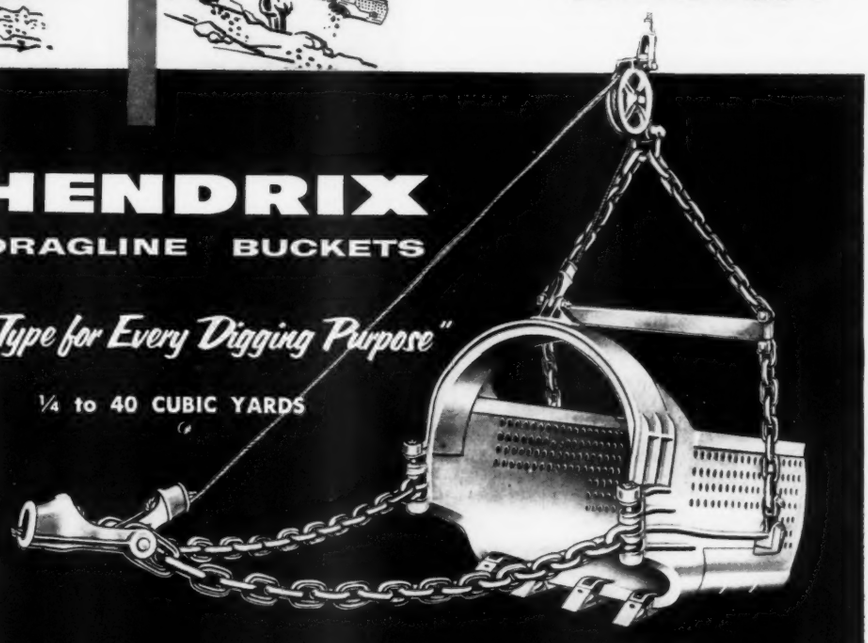
For more facts, use Request Card at page 18 and circle No. 343

Engineered for today's greater production demands!

HENDRIX
DRAGLINE BUCKETS

"A Type for Every Digging Purpose"

¼ to 40 CUBIC YARDS



All Hendrix Buckets available without perforations

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

Hendrix Lightweight Dragline Buckets

For more facts, use Request Card at page 18 and circle No. 344

The new LeTourneau-Westinghouse front-of-engine power takeoff features enclosed gears from engine to drum transmission. The drive unit includes a mechanism for adjusting the engine speed from either end of the mixer.

Truck mixer power takeoff features enclosed gears

A new truck engine drive for Westinghouse mixers is announced by the Westinghouse Transit Mixer Division of LeTourneau-Westinghouse Co.

The new drive, from engine to drum transmission, uses enclosed gears throughout.

Two sets of bevel gears transfer power from the engine to the side of the truck frame. The drive shaft, with grease-packed universal joints, transmits the power back to the drum drive transmission through two sets of bevel gears.

All gears are spiral bevel cut for full tooth contact and quietness and are of hardened alloy steel for long life. All shafts run in ball bearings. According to the manufacturer, the gear drive is always positive and dependable, needing no more attention than a truck differential.

The drive is adaptable to practically any truck on which the engine crankshaft either has or can be fitted with a take-off face, and if the drive assembly from engine to offset drive can be run under or through a hole in the radiator.

For further information write to Westinghouse Transit Mixer Div., LeTourneau-Westinghouse Co., Dept. C&E, P. O. Box 853, Indianapolis 6, Ind., or use the Request Card at page 18. Circle No. 96.

Easy joining conduit saves installation time

Its new, type D plastic conduit is announced by the Carlon Products Corp.

To join two 10-foot lengths of the conduit, it is only necessary to brush Carlon D solvent cement on the outside ends of the pipe and inside the couplings—then push together. In minutes the cement is set, resulting in a permanent weld.

No special tools are needed; it cuts with a handsaw.

This new conduit, having a rubber and styrene base, will not absorb water even after many years of use, and resists traffic shock, the manufacturer reports.

A complete line of fittings is available.

For further information write to the Carlon Products Corp., Dept. C&E, 10225 Meech Ave., Cleveland 5, Ohio, or use the Request Card at page 18. Circle No. 103.

Two-speed, portable hydraulic power pump

A new, portable high-pressure hydraulic power pump said to fill the need for two-speed, fast-approach operation has been introduced by Greenlee Tool Co.

The No. 798-AC-SA power pump, driven by a ¾-hp, 115-230-volt electric motor, will handle a wide variety of hydraulic power applications, including Greenlee benders for pipe and conduit. Under instant fingertip control at all times, tests show that this pump can operate a hydraulic ram or jack three to five times faster than a hand pump.

The new unit, featuring a fast-approach, two-speed action, will automatically change over to high pressure as the ram load increases. Three-position control—advance, neutral, and return—is provided, with neutral holding the ram pressure and position while the motor is running. Valving provides high-pressure advance only and allows spring action, manual, or gravity return of the ram. Capable of working at a continuous pressure of 6,000 psi, the pump can develop up to 10,000-psi intermittent pressure.

For further information write to the Greenlee Tool Co., Dept. C&E, 2136 12th St., Rockford, Ill., or use the card at page 18. Circle No. 66.

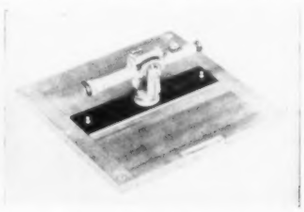
Takes the tough jobs st

NEW MAGNETIC DRILL PRESS
with HYDRA-POWER FEED
precise and remote control

With a capacity of 50 tons at a 12-foot radius, this Orton crane is particularly valuable for handling heavy machinery and equipment, as well as for extra-heavy road, quarry, or field handling assignments. The machine is equipped with torque-control clutch, air-operated controls, and other standard Orton equipment. The tires are 24.00×25-24-ply dual-traction lugs. For further information about the Orton crane, write to the **Orton Crane & Shovel Co.**, Dept. C&E, 14730 Vanowen St., Van Nuys, Calif., or use the Request Card at page 18. Circle No. 173.

Alidade for small-scale topographical surveys

A new alidade for small-scale topographical surveys is announced by the David White Instrument Co. The unit, called the No. 9179, has a telescope length of 10 inches. Power is 10 times magnification of high resolution and permits detailed reading



at a distance. Field of view is 2.45 degrees, 50 minutes for wide coverage.

Both clamp and tangent are precision-machined from solid brass. The clamp positively locks the telescope at the desired angle; the tangent screw acts on a spring-loaded plunger for micrometer adjustment.

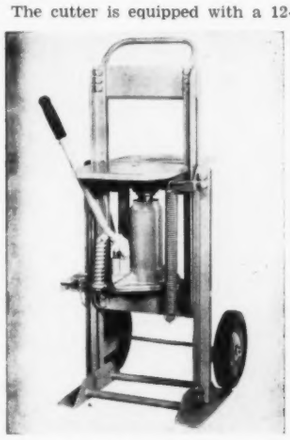
For further information write to the David White Instrument Co., Dept. C&E, 2051 N. 19th St., Milwaukee 5, Wis., or use the Request Card at page 18. Circle No. 33.

Masonry cutter features full-powered design

Its Speedy masonry cutter is announced by the Rice Pump & Machine Co.

According to the manufacturer, the unit's two-wheel portability and full-powered design eliminates the need for several models: cranking mechanisms for blade clearance adjustment are eliminated; blades reset themselves for the next cut by spring tension when the hydraulic valve is opened, or the blades may be brought together by stepping on the foot pedal.

The cutter is equipped with a 12-



ton hydraulic ram. Power is applied to the upper blade, thereby exerting the cutting force downward in order to eliminate jump at time of cut.

The blades are made of special heat-treated alloy steel, and have a 10-inch width of opening.

For further information write to Rice Pump & Machine Co., Dept. C&E, 400 Park Ave., Belgium, Wis., or use the Request Card at page 18. Circle No. 109.

←For more facts, use coupon or circle No. 345

bs standing on its head!

Mail coupon below for free demonstration of NEW Black & Decker Magnetic Drill Press!

table, one-piece power unit, built-in drill point locator insure finest precision!

The new B&D Magnetic Drill Press is so loaded with ter-wanted features—that it just has to be seen to appreciated. To see it at work on your own application, mail coupon below for a free demonstration.

For instance: Its exclusive two-piece construction kes it simple to position the magnet. The built-in ill point locator makes accurate placement effort-. An easy twist of the 1¼" capacity drill press ck locks it in place on the magnet.

And it's there to stay! Extra power magnet clings ⅛" and thicker steel with a giant's grip. This new &D Magnetic Drill Press needs no cool-off period. stable in any direction, provides highest accuracy all times.

Like the full line of B&D Portable Drills, this w tool is power-packed, quality built. See it for urself. Mail coupon for free demonstration to THE ACK & DECKER MFG. CO., Dept. 1309, Towson Md. (In Canada: P.O. Box 278, Brockville, Ont.)

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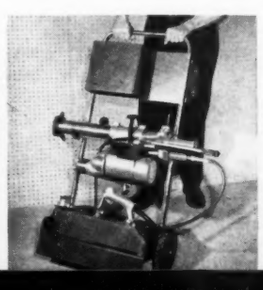
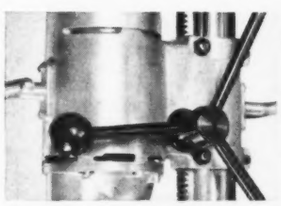
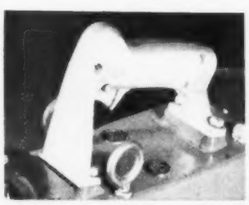


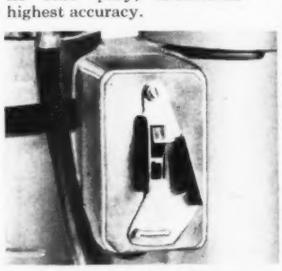
CLUSIVE TWO-PIECE CONTRUCTION (magnet separate m drill press) and tool dy for easier, safer han-ng. Caddy keeps tool in one ce—ready for the job. Unit ed in position with mini-um exertion.



UNITIZED CONSTRUCTION of drill press cannot work loose, no side play, maintains highest accuracy.

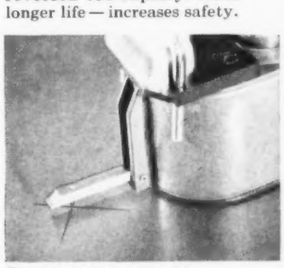


SAFETY-GRIP SWITCH keeps magnet always "on" after operator releases switch trigger — another safety plus.

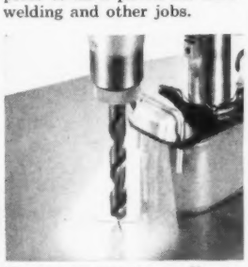


REVERSING SWITCH with time delay prevents motor being reversed too rapidly. Adds longer life — increases safety.

VERSATILE MAGNETIC UNIT can be used apart from drill press to hold pieces for butt welding and other jobs.



DRILL POINT LOCATOR provides accuracy never before possible. Gets close tolerances fast. Built into magnet.



EXCLUSIVE HEADLIGHT directs bright beam on work area. Special ruggedized bulb withstands hard usage.

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The BLACK & DECKER MFG. CO., Dept. 1309, Towson 4, Md.

☐ Please arrange a demonstration of the new B&D Magnetic Drill Press.

☐ Please send me additional information.

Name.....Title.....

Company.....

Address.....

City.....Zone....State.....

"BERG"
CONCRETE
SURFACERS

for: bridges, highways, airport runways, dams, culvert, floors, walls.

Model H-8 and H-10 (above). Gasoline powered unit especially designed for surfacing concrete highways, runways, streets, floors. Includes exclusive power take-off for attaching "BERG" flexible shaft surfacing equipment. Model A (right) is lightweight, electric powered unit that suspends from operator's shoulder. Equipped with interchangeable heads and attachments for surfacing bridges, buildings, dams, culvert, walls or similar surfaces. Wire or write for details.

CONCRETE SURFACING MACHINERY CO.

4665 Spring Grove Avenue Cincinnati 32, Ohio

For more facts, use Request Card at page 18 and circle No. 346

FARRELL-CHEEK

FOR A FULL LINE OF

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WIRE ROPE SOCKETS

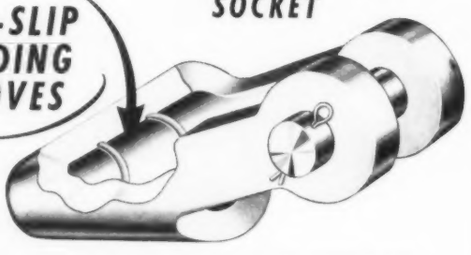
ALL TYPES AVAILABLE BOTH OPEN AND CLOSED

Improved WEDGE TYPE SOCKET

STANDARD WEDGE TYPE SOCKET

STANDARD TYPE SOCKET

NON-SLIP BONDING GROOVES



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FARRELL-CHEEK STEEL CO.

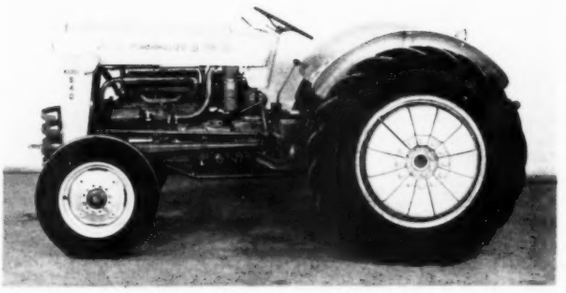
HIGHEST QUALITY ELECTRIC FURNACE CARBON AND ALLOY STEEL CASTINGS

FARRELL'S CARBON STEEL CASTINGS	RAILROAD CASTINGS Locomotive and Car R. R. Specialty Castings	GEARS AND PINIONS "True Tooth" Gears and Pinions, Sheaves and Wheels.	STOKER PARTS Feed Screws, Furnace Tools, Flanged Pipe, etc.
F-C HARD EDGE STEEL CASTINGS	ELEVATOR, CONVEYOR PARTS Sprockets, Traction Wheels, Chains, Buckets, Rollers, Idlers, Bushings.	CRANE WHEELS Overhead, Gantry, Mono-rail, Ingot Car, Charging Machine.	HEAVY HARDWARE Complete Line Wire Rope Fittings and Cutters, Bar Benders and Cutters.
F&S STEEL CASTINGS			

YOUR INQUIRY WILL PROMPTLY BRING DETAILED INFORMATION PERTAINING TO ANY OF THE ABOVE FARRELL-CHEEK PRODUCTS

SANDUSKY, OHIO

For more facts, use Request Card at page 18 and circle No. 347



A new addition to the Ford tractor line is this Model 840, equipped with the large 172-cubic-inch piston displacement engine and a 4-speed transmission as standard equipment. The unit is capable of being equipped with an optional over-and-under transmission to give 12 forward and 3 reverse speeds, and a top speed in excess of 20 mph.

Announce new tractor, 4-speed transmission

Its new Model 840 4-wheel tractor and a 4-speed transmission option for the Model 820 tractor are announced by the Tractor and Implement Division of the Ford Motor Co.

The new Model 840 resembles the 850 tractor but has the 4-speed transmission as standard equipment. This allows both the 840 and 820 to be equipped with a recently adopted over-and-under transmission as a factory-installed option.

These 800 series tractors, with the over-and-under transmission installed, are all-purpose tractors with twelve forward and three reverse speeds. The large 172-cubic-inch piston displacement engine is standard equipment on these tractors.

The over-and-under transmission provides two additional speed ranges for each gear ratio of the 4-speed transmission. Thus, with a 4-speed transmission, the user has a choice of twelve different forward gear speeds, including one in excess of 20 mph.

For further information write to the Ford Motor Co., Tractor & Implement Div., Dept. C&E, 2500 E. Maple Road, Birmingham, Mich., or use the Request Card at page 18. Circle No. 167.

Chassis rebuilding kit saves cost of new truck

A new rebuilding kit—consisting of current-model production parts—for use in rehabilitating any make of truck comparable to Autocar six-wheel diesel Models DC 10264 and DC 10264 L (lightweight) is offered by the Autocar Division of the White Motor Co.

Providing all parts for a completely new Autocar chassis without power train (engine, clutch, transmission, drive line, front and rear axle assemblies), the kit is said to permit rebuilding of a typical truck at an average cost of from $5,400 to $6,500. This includes cost of the kit, selected optional parts, and labor, and compares with an estimated cost of $15,000 for

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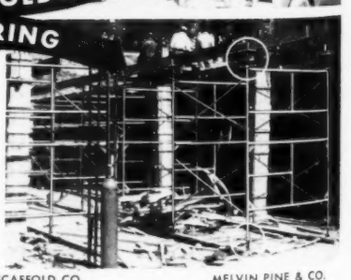
TUBULAR STEEL

SCAFFOLDING

FOR

BOTH SCAFFOLDING SHORING



Get Versatility PLUS Speed and Safety . . . at low cost!

Whether used for shoring or for scaffolding, Bil-Jax goes up fast . . . and stays put. No tools needed. Screw-jacks inserted in tubular steel legs make leveling easy. No need for heavy investment in two kinds of equipment, and no salvage loss.

Ask for complete 24-page catalog. It's free.

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BIL-JAX, INC. • ARCHBOLD, OHIO

For more facts, use Request Card at page 18 and circle No. 348

a comparable new truck.

Designated No. 216483, the basic kit consists of the following parts: Frame cross members and brackets, front springs and mounting parts, engine mounting parts, clutch control parts, steering gear and transfer level assembly, complete radiator assembly, head lamps and mounting assembly, fender assemblies and mounting parts, running board and splash apron assembly, hood panel assembly, and cab mounting parts.

Optional parts can be ordered as part of the kit according to needs and requirements. Each kit can be supplied with various screws, washers, and nuts required for assembly.

For further information write to Autocar Div., White Motor Co., Dept. C&E, Exton, Pa., or use the Request Card at page 18. Circle No. 72.

Announce rental plan for utility buildings

Portable, prefabricated construction offices like the one in the foreground are available either by rental or purchase from the Porta House Co. Rental service includes delivery, erection, and removal from site.

A new nationwide rental plan for contractors and builders is announced by the Porta House Co.

The Porta House is a portable prefab building designed to save time and money, for use as contractors' field or job offices, tool shed, timekeepers' or inspectors' offices, etc.

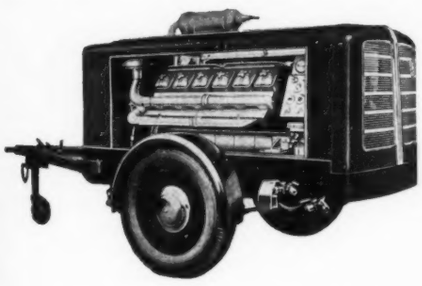
Some of the features of the product are: one man can erect a 6×9-foot Porta House in an hour and can move it again on a pickup truck; comes prefabbed complete with doors and windows, in 3-foot sections of marine plywood, painted, and with or without floors; can be added to or reduced in size by 3-foot multiples; available in 6×9-foot to 12×60-foot sizes; two or more standard sizes may be put together; interchangeable panels make it possible to have any number of windows and doors in any position; simple, bolted construction means no nail damage, quick erection, complete salvage on dismantling.

Porta House rental service includes delivery, erection, and removal from site. The buildings are also available for purchase.

For further information write to the Porta House Co., Dept. C&E, 6767 Broadway Terrace, Oakland, Calif., or use the Request Card at page 18. Circle No. 172.

MODERN AIR COOLED DIESEL DRIVEN COMPRESSORS

Won't sweat at 140° F. Won't ice up at 40° F. below zero



FIVE MODELS FROM 55 TO 320 CFM CAPACITY

Regulate rpm to load with adjustable throttle setting. Don't race the engine to catch a half empty receiver. Acceleration from low idle to top rpm wastes fuel.

Battery self-starting. No clutch. Lubricate, fuel up, start and the I&E will do the rest. Every machine unconditionally guaranteed for three months.

IRMER & ELZE COMPRESSORS Sole Agents

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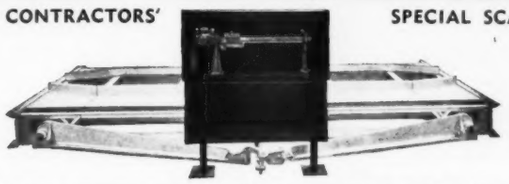
2339 W. BEAVER ST. P.O. BOX 2976 JACKSONVILLE, FLA.

For more facts, use Request Card at page 18 and circle No. 349

To obtain further information on any of the products described in this section, circle the number given at the end of the item on the Request Card at page 18.

WINSLOW—PORTABLE TRUCK SCALE

THE CONTRACTORS' SPECIAL SCALE



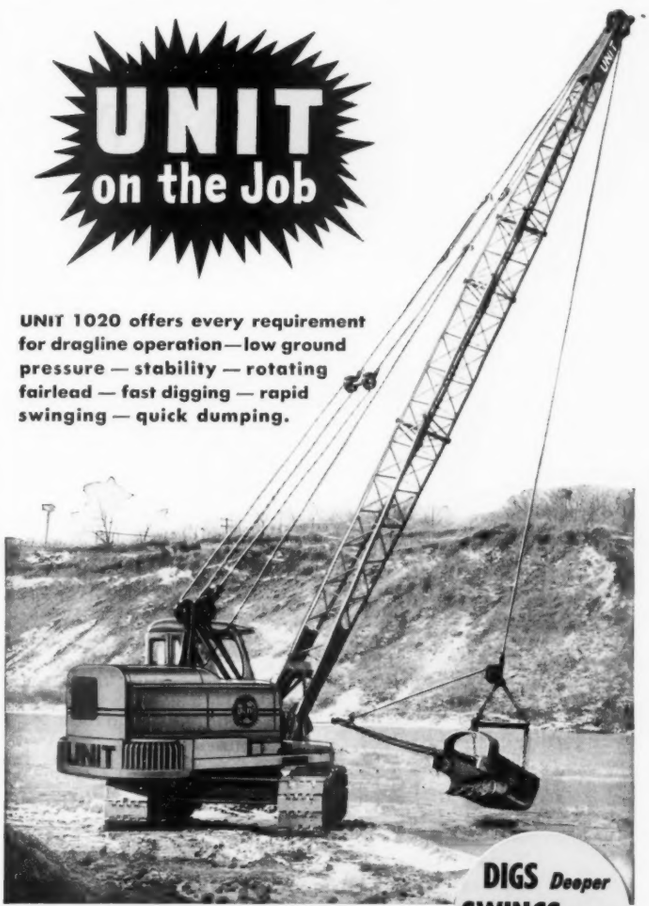
For use at temporary and permanent locations—at stock piles and by bituminous material contractors at the job site. Cap.: 15-18-20-30, 50 tons.

Write us for name of your nearest distributor

WINSLOW SCALE COMPANY P.O. Box 1198 Terre Haute, Indiana

For more facts, use Request Card at page 18 and circle No. 350

UNIT on the Job



UNIT 1020 offers every requirement for dragline operation—low ground pressure — stability — rotating fairlead — fast digging — rapid swinging — quick dumping.

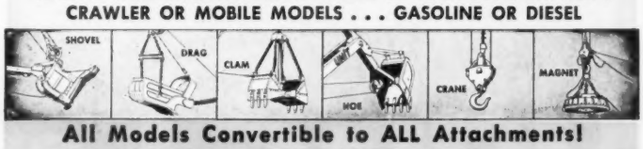
DIGS *Deeper*
SWINGS *Easier*
LOADS *Faster*

Perfectly balanced for long boom operation, the UNIT 1020 is ideal for general excavation work, sand and gravel pits, irrigation, drainage and stripping operations. Available with UNIT TORQUE DRIVE, this machine gives you smooth performance, eliminates "shock loads", cuts fuel expense. Write for literature.

UNIT CRANE & SHOVEL CORPORATION

6309 WEST BURNHAM STREET • MILWAUKEE 14, WISCONSIN, U. S. A.

½ or ¾ YARD EXCAVATORS...CRANES UP TO 20 TONS CAPACITY
CRAWLER OR MOBILE MODELS . . . GASOLINE OR DIESEL



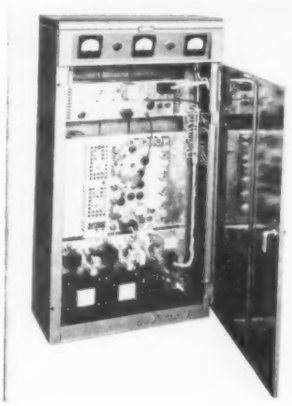
All Models Convertible to ALL Attachments!

For more facts, use Request Card at page 18 and circle No. 351

Offer new broad-band point-to-point radio

A radio-telephone system which bridges telephone service over terrains where it would be physically or economically impractical to install telephone lines is announced by Allen B. Du Mont Laboratories, Inc.

Designated the Du Mont MCA-474-B three channel multiplex station, the equipment utilizes broad-band, point-to-point radio in the ultra-high frequency range of 450 mcs. Characteristics of the 450 mc band include virtually no skip interference, low ambient noise (particularly in industrial areas), and better



control of the area to be covered by a particular base station antenna, the manufacturer reports.

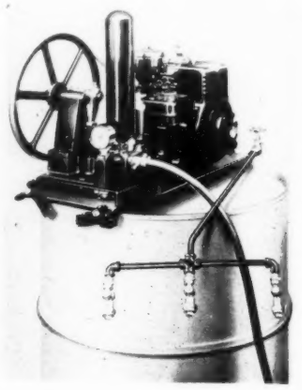
The equipment, consisting of a transmitter, receiver, power supply, and control panel, has forced ventilation and an air-circulating system included in its design.

For maximum versatility, the equipment is packaged in 40, 67, or 72-inch cabinets, all electrically identical.

For further information write to Allen B. Du Mont Laboratories, Inc., Dept. C&E, 750 Bloomfield Ave., Clifton, N. J., or use the Request Card that is bound in at page 18. Circle No. 83.

Pump applies silicone water repellents

A pump for applying silicone water repellents to any masonry structure is announced by the Campbell-Hausfeld Co. The Model WP-100 waterproofer can be used for applying repellents above ground to brick, concrete, concrete block, cinder block, and sandstone, as well as on pitch



base coatings below grade before backfills are made.

The Model WP-100 discharges up to 1½ gpm, with pressure adjustable for any height structure. Two operators with two guns can work off one unit.

Mounted on a steel base, the waterproofer fastens and locks on top of a standard 55-gallon material drum with a unique winged bar arrangement. It is powered with a 1½-hp 4-cycle gasoline engine or electric motor. The complete unit includes hose and three nozzle applicators.

For further information write to the Campbell-Hausfeld Co., Dept. C&E, 801 Moore St., Harrison, Ohio, or use the Request Card at page 18. Circle No. 31.

NOW
U.S. SAVINGS BONDS
PAY YOU HIGHER INTEREST
FASTER!

If you've always bought U.S. Savings Bonds for their rock-ribbed safety, their guaranteed return, the way they make saving easier—you've got one more reason now!

Every Series E United States Savings Bond you've bought since February 1, 1957 pays you a new, higher interest—3¾% when held to maturity! It reaches maturity *faster*—in only 8 years and 11 months. And redemption values are higher, too, especially in the earlier years.

About your older Bonds? Easy. Just hold onto them. As you know, the rate of interest a Savings Bond pays increases with each year you own it, until maturity. Therefore, the best idea is to *buy the new—and hold the old!*

The main thing about E Bonds, of course, is their complete safety. Principal and interest are fully guaranteed. They are loss-proof, fire-proof, theft-proof—because the Treasury will replace them without charge in case of mishap. Your Savings Bonds are as solid as a rock—backed by the full faith and credit of the United States.

Maybe you already know about Savings Bonds—as one of the 40 million Americans who own them today, or as one of the other millions who have used Bond savings to help pay for new homes, cars, or college educations, or to make retirement financially easier. If so, this is familiar territory to you—you *know* there's no better way to save.

But if you're new to the game, find out about Savings Bonds and what they can do for your future. Ask your banker, or check with your employer about the automatic Payroll Savings Plan that makes saving painless and easy.

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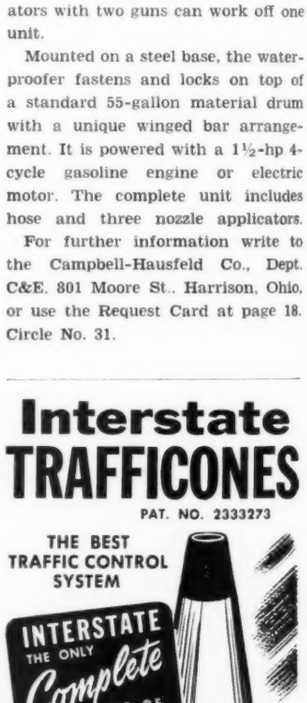
PAT. NO. 2333273

THE BEST TRAFFIC CONTROL SYSTEM



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206A AVILA ST., LOS ANGELES 12, CALIF.

For more facts, circle No. 353

CONTRACTORS AND ENGINEERS

Tamper features handling ease, improved seal

A new heavy-duty pneumatic backfill tamper is available from the Gardner-Denver Co. Designated the Model T-43, the unit is said to be easily manipulated.

The tamper has an improved seal that keeps dirt out, assuring longer service life, and a heavily chrome-plated handle and piston rod that resist corrosion and wear, according to the manufacturer.

A powerful, positive tripping valve for quick, solid blows is claimed for the unit. Other features include built-in lubricator; choice of aluminum or hollow steel butts; and non-freezing construction, said to assure operation under all weather conditions.

For further information write to the Gardner-Denver Co., Dept. C&E, S. Front St., Quincy, Ill., or use the Request Card at page 18. Circle No. 111.

Bituminous spray tank

Its Model 101 utility spray tank for bituminous materials is available from Littleford Bros., Inc.

According to the manufacturer, the Model 101 combines three operations in one unit—bar spraying with the standard 10-foot tubular bar with shifting mechanism or 8-foot mechanically operated full circulating bar; hand spraying; and pouring pot patching.

The Model 101 is available as a truck mounted or trailer unit.

For further information write to Littleford Bros., Inc., Dept. C&E, 453 E. Pearl St., Cincinnati 2, Ohio, or use the Request Card at page 18. Circle No. 180.

Offer selective-action ¼-inch electric drill

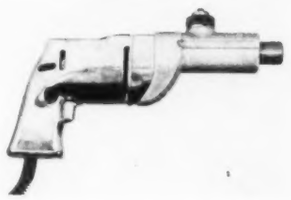
A selective-action ¼-inch electric drill which combines both pneumatic-type impact action for carbide masonry drilling plus regular action is announced by the Power Tools Corp.

Designated the Uni-Drill, it is rated at 3 amps industrial for continuous service and will take up to 1-inch carbide masonry drill bits. Drill speed is 2,500 rpm; 1,700 rpm under load.

A selector control on top of the drill turns to release the internal impact cam, allowing it to float for conventional drill action in wood, steel, and similar materials.

The drill is provided with a standard Jacobs ¼-inch chuck for carbon and high speed bits. Adaptors are furnished for carbide masonry drills from 3/16 to 1-inch diameter.

For further information write to the Power Tools Corp., Dept. C&E, 1421 Lakeside Ave., Cleveland 14, Ohio, or use the Request Card at page 18. Circle No. 168.



this is the **TS-360**

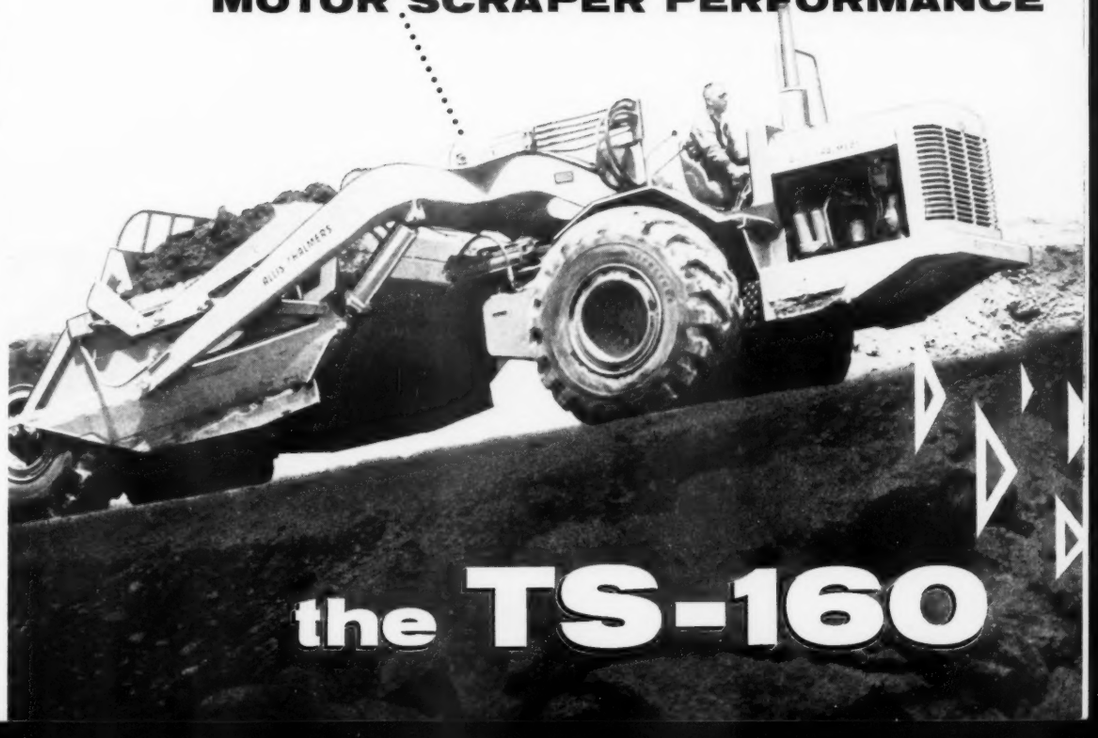
15 yd struck
20 yd heaped
280 horsepower

this is the **TS-260**

11 yd struck
14 yd heaped
200 horsepower

now...

ALLIS-CHALMERS
BRINGS YOU ANOTHER
NEW MEASURE OF
MOTOR SCRAPER PERFORMANCE



the TS-160

For more facts, circle No. 354 →

New vibrator features motor-in-head design

A new universal electric, motor-in-head concrete vibrator is announced by the Thor Power Tool Co.

The motor-in-head construction of the new Thor vibrators is said to eliminate the need for heavy, cumbersome, high-maintenance flexible shafts and to permit easy one-man operation.

A universal type motor, operating on 115 volts, ac or dc, on 25, 50, or 60 cycles, powers the vibrating head at 15,000 rpm without load and 12,000 rpm in 2-inch slump concrete. Specially designed for concrete vibrating, the motor is triple-insulated against heat and heavy loads. Thermal controls automatically shut off current in case of excess heat or overload to prevent motor burnouts.

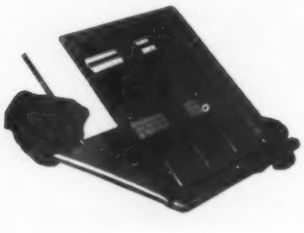
The switch is made of high-strength aluminum and is streamlined to prevent catching on reinforcing rods.

The new Thor vibrator is available in three models: Model CV2-10 with 10 feet of hose; CV2-20 with 20 feet of hose; and CV2-210 featuring a 10-foot length of hose on each end of the switch. All models include a 25-foot 3-conductor electric cable.

For further information write to the Thor Power Tool Co., Dept. C&E, 175 N. State St., Aurora, Ill., or use the Request Card at page 18. Circle No. 166.

New aluminum holder for pencils, scales, paper

A handy aluminum sheet holder for pencils, scales, note paper and other similar accessories is available from the Stratex Instrument Co., Inc., of Los Angeles.



Fabricated of non-magnetic, satin-finish alloy with snap-spring covers to eliminate pressure tapes, clips and thumb tacks, each holder has a heavy mildew-resistant cowhide pencil and scale pouch flush-riveted to the lid. The cowhide pouch in the most popular sizes is molded and compartmented to accept two standard pocket scales and four pencils of varying hardness or color.

The device is particularly applicable when note taking or map reading in confined spaces, as the molded leather compartments tend to clutch and retain pencils and scales not being used. The standard size holder is built to accommodate multiples of $8\frac{1}{2} \times 11$-inch standard sheet size for notes, graph paper, maps and charts, but a variety of sizes is available.

Small triangles, protractors, and like tools are securely gripped by the spring cover if desired, and carried integrally with the protected documents, ready to simulate a miniature portable field desk as needed.

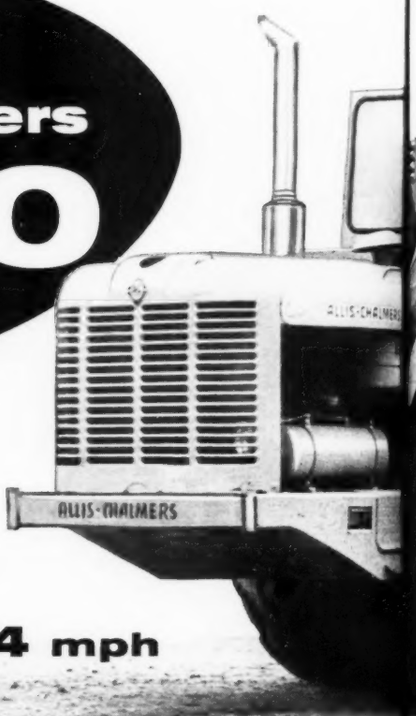
For further information write to the Stratex Instrument Co., Inc., Dept. C&E, 3515 Sunset Blvd., Los Angeles 26, Calif., or use the Request Card that is bound in at page 18 of this issue. Circle No. 92.

Concrete curing agent contains no resins, waxes

A new, economical concrete curing agent that contains no resins or waxes is announced by the Walter Maguire Co., Inc.

According to the manufacturer, Emeri-Crete Kure is a non-resinous sodium silicate compound that cures newly laid concrete and hardens it by converting the free lime to calcium silicate, while at the same time pre-

NEW Allis-Chalmers
TS-160



7 yd struck
9.5 yd heaped
155 horsepower
5 speeds to 25.4 mph
12-ton payload

Measure these advantages for

22 hp per struck yard—Big Allis-Chalmers supercharged diesel engine delivers extra lugging ability for tough pulls, fast loading. Versatile TS-160 can team up with big equipment or work alone on long- or short-haul construction jobs—handle a wide range of utility jobs, travel at speeds up to 25.4 mph.

Measure these features... Allis-Chalmers 516-cu-in. diesel engine—dependable power at all working speeds • Independent, constant live hydraulic power for steering and scraper operation • Low, wide bowl—8-ft, 1½-in. cutting edge . . . 3-piece, interchangeable cutting edges . . . double-acting hydraulic bowl lift jacks • Positive hydraulic ejection, high apron lift to full 7-ft, 1½-in. opening • Roomy operator's compartment, easy-to-reach controls, 24-volt direct electric starting, adjustable bucket-type seat, synchronized 4-wheel air brakes • Big push block for all types of pushers—positioned for in-line push • Full-circle visibility while loading, spreading and traveling . . . operating ease under all conditions • 17¾-in. minimum ground clearance in hauling position.

venting excessive air drying. The new product is said to be ideal as a curing agent for areas that must be covered with resilient floor coverings.

The solution is applied to freshly placed concrete directly from the shipping containers, and one application at the rate of 500 square feet per gallon cures and hardens at the same time, the manufacturer reports.

Power spray application is recommended, although the cure may be applied with a hand spray, a hair broom, or a burlap drag.

For further information write to the Walter Maguire Co., Inc., Dept. C&E, 60 E. 42nd St., New York 17, N. Y., or use the Request Card at page 18. Circle No. 115.

New drag bit drill head for soft-rock drilling

The Austin Powder Co. has announced a new drag bit drill head said to increase greatly air-blast drilling speeds in soft-rock formations Designated the Model APA, it is said to cut through soft shales, clays, shells, soft limestone, red beds, and other rocks having low compressive strength in less than half the time required by ordinary drill heads with rotating bits.

Of three-wing prop-type design, the APA head is furnished with special patented carbide-tipped bits. The latter have tapered shanks that drive-fit firmly into the drill head so that wedges and set screws are not needed. Bits can be quickly changed with hammer and punch.

The Model APA drag bit drill head.

The APA drill head is available in five sizes of cutting holes of from $4\frac{5}{8}$ to $8\frac{5}{8}$ inches in diameter. It is also offered with square and hexagonal shanks, and can be adapted to any drill rig.

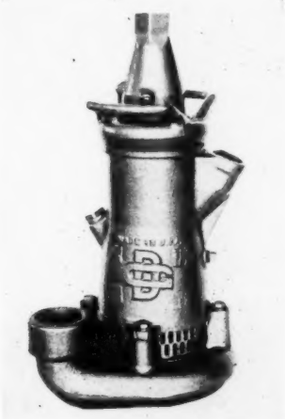
For further information write to Austin Powder Co., Dept. C&E, Rockefeller Bldg., Cleveland 13, Ohio, or use the Request Card at page 18. Circle No. 71.

Announce large-capacity pneumatic sump pump

The Model VP-8 pneumatic sump pump has been announced by the Gardner-Denver Co. According to the manufacturer, the unit is designed specifically to meet the demand for an air-driven pump of larger capacity and higher head.

The Model VP-8 has a capacity of 250 gpm and handles up to 280 feet.

Like the smaller Model VP-4, the new pump is designed with intake above the broad, flat bottom that rests in the mud during operation.



Additional advantages said to be features of the pump's operation are that the direct air flow through the pump motor increases efficiency by reducing friction; all bearings are uniform in size to reduce repair stock; an inexpensive, easy-to-install packing unit seal is included; all bearings run in oil; and that O-ring seals provide extra protection against leakage.

Over-all height of the Model VP-8 is 24 inches. Weight is 110 pounds, and the unit will enter an opening up to 11×13 inches. The oiler capacity is $2\frac{1}{4}$ quarts.

For further information write to Gardner-Denver Co., Dept. C&E, S. Front St., Quincy, Ill., or use the Request Card at page 18. Circle No. 74.

← For more facts, use coupon or circle No. 355

for a wide range of construction jobs . . .

Turns non-stop in less than 25 ft with 90-degree hydraulic steering . . . easy maneuverability in narrow cuts, faster cycles without reversing in tight turn-arounds.

Moves quickly from job to job . . . when required, transport wheels are available to meet legal load limits for highway travel.

Allis-Chalmers, Construction Machinery Division
Milwaukee 1, Wisconsin

ALLIS-CHALMERS

Engineering in Action

GENTLEMEN: Have the Allis-Chalmers Construction Machinery dealer serving my area arrange a demonstration of the TS-160 motor scraper for me ☐.

Name _____

Address _____

City _____ State _____

Type of work _____

Cemco's new Mobile Work Shop has a 5-ton crane, plus air compressor, generator-welder, and tool and parts compartments.

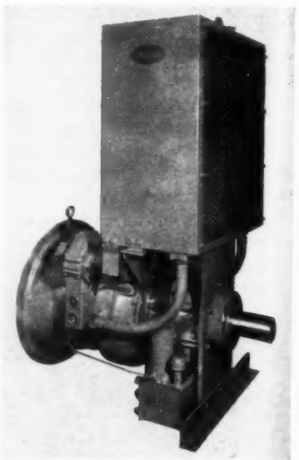
Mobile repair shop carries 5-ton crane

A truck-mounted maintenance shop on wheels is announced by Cemco Industries, Inc. A principal feature of the Mobile Work Shop is the winch-equipped 5-ton crane, which can be completely disassembled and stored inside the truck when the vehicle is in transit.

The truck shop also includes a 125-cfm air compressor and a combination 15-kv generator and 300-amp 40-volt welder. The air compressor and the generator-welder are operated by a Cemco split-shaft power take-off. Compartments and sidewall bins provide ample storage for parts and tools.

The work shop on wheels is said to be particularly useful in field maintenance, and is also recommended for certain phases of construction. A feature stressed by the company is the unit's ability to get from job to job at highway speeds.

For further information write to Cemco Industries, Inc., Dept. C&E, Galion, Ohio, or use the Request Card at page 18. Circle No. 69.



The Twin Disc three-stage torque converter has a maximum rating of 586 horsepower at 2,200 rpm.

Higher-capacity torque converter is announced

A new, higher-capacity version of its 11,500 Series three-stage torque converter is announced by the Twin Disc Clutch Co. The new unit has a maximum rating of 586 horsepower at 2,200 rpm, with impellers available for specific torque ratings of 340, 390, 450, and 540 pound-feet.

Current production units include the Model CF, which provides a clutch at the flywheel, and the Model F, which is connected to the flywheel with a driving ring. Both types are designed for SAE No. 0 flywheel housings.

A Twin Disc C-3 rear end, with the output shaft supported by two heavy-duty roller bearings, is available with either model, permitting maximum sidepull to be taken from the torque converter. Available as optional equipment is a radiator integrally supported as a part of the converter.

For further information write to Twin Disc Clutch Co., Hydraulic Div.,

Close Quarters Can't Confine... the HYSTER D4 HYDRAULIC BACKHOE

HYSTER COMPANY

D4 BACKHOE MAKES MORE JOBS "ONE MACHINE" JOBS

HYSTER

Portland, Oregon
Peoria, Illinois
Nijmegen, The Netherlands

- Simultaneous hoist-and-swing.
- Full digging power anywhere within the 240° swing arc.
- Unobstructed operator visibility.

These PERFORMANCE FEATURES make this job "routine" for the backhoe in spite of obstacles restricting operating space at this crowded industrial site.

Match these **ADDITIONAL PERFORMANCE FEATURES** to your own job requirements, and you will understand why more and more contractors are making use of the dependable, low-cost power of the D4 Backhoe to cut operating costs and step up production.

	On D4 Tractor	On 955 Traxcavator	On HT4 Traxcavator
Maximum Reach From Tractor Rear Sprocket	20'4"	20'9"	20'11"
Maximum Digging Depth	13'	12'3"	12'9"
Clearance at Beginning of Dump	9'7"	10'3"	9'9"
Clearance at End of Dump	14'9"	15'5"	14'11"
Dipper Wrist Action	104°	104°	104°

4 Tons of Tooth Force • Track-type Tractor Mobility
Combination Hoe and Heavy-duty Bulldozer

For more facts, use Request Card at page 18 and Circle No. 356

Lower Construction Costs with Factory-Built

UTILITY BUILDINGS

30' x 100' Building

Save on Original Cost, Erection, Reuse and Resale Value!

Storage or temporary housing—field offices, tool sheds or workshops—there's an attractive, functional ECONOMY Utility Building available for any requirement in a variety of designs and sizes from 6'x8' to an extensible 30' x 250' and up. Constructed in sections of kiln-dried, tongued and grooved west-coast lumber. Quick to assemble, dismantle, transport. Can be extended at any time. Delivered complete—exterior painted. Used by many of the nation's most successful construction firms. Readily adaptable to special requirements.

Dealer Territories Open

7½' x 16' Mobile Building

ECONOMY BUILDINGS INC.
(SINCE 1922)
Dept. G-13 West Chicago, Illinois

For more facts, circle No. 357

Dept. C&E, 1310 Preston St., Rockford, Ill., or use the Request Card at page 18. Circle No. 147.

New pumps provide high volume at high pressures

Two new hydraulic pumps built especially to provide high volume at high pressures are announced by the Owatonna Tool Co.

One, a 6,000-psi pump with a 2-hp ac-220-440 motor, provides 220 cubic inches of oil per minute at zero pressure and 140 cubic inches at maximum pressure. The other is a 10,000-psi pump powered with a 3-hp ac-

320-440 motor and provides the same oil flow per minute.

Both pumps are equipped with a three-position lever-operated valve either for single or double-acting rams and are fitted with filter, pressure gage, and 2-gallon reservoir, all enclosed in a welded metal case. The case measures 23 inches high, 19 inches wide, and 30 inches long.

The fixed displacement radial pump is said to be built on a radically improved design which enables it to generate high pressure without loss of mechanical efficiency. Pressure is generated within hollow pistons and the higher the pressure, the tighter the seal between the moving piston, cylinder sleeve, and pump body. This design assures greater efficiency with longer life, according to the manufacturer.

For further information write to the Owatonna Tool Co., Dept. C&E, 381 Cedar St., Owatonna, Minn., or use the Request Card at page 18. Circle No. 86.

Self-heating asphalt iron

Its Surfa-Slick Model B self-heating asphalt iron designed to throw heat directly onto the paving surface by means of a longitudinal slot at the bottom of the shoe is offered by Camm Mfg.

It may be used first as a burner to disintegrate the old asphalt material, and then as a surfacer for the new material.

For use with either hot or cold mix, the unit is said to develop over 650 degrees of constant, regulated heat for a penetration depth of 2½ inches.

For further information write to Camm Mfg., Dept. C&E, 1425 First St., San Fernando, Calif., or use the Request Card at page 18. Circle No. 181.

Substantial savings in the handling costs of dry cement are claimed for this pneumatic-unloading bulk cement silo and trailer offered by the Forster Mfg. Co. Available in a standard unit, or custom-made to requirements, the new Forster unit is designed to eliminate unloading delays with positive and efficient pneumatic or conveyor-combination unloading. Featuring low clearance and even load distribution, the 100-barrel-capacity silo is permanently watertight, and the entire unit is built to withstand unusually rugged road conditions. For further information write to the **Forster Mfg. Co.**, Dept. C&E, Ada, Okla., or use the Request Card at page 18. Circle No. 45.

How "D Handyman"

saves time, cuts costs on your earthmoving jobs

Speedy, maneuverable LeTourneau-Westinghouse D Tournapull® has a place on every contractor's earthmoving team. The 9-yd. "D" handles small jobs with an economy and efficiency that big rigs can't match. And on big projects — in the border areas where the big job splits up into many small scattered operations — Tournapull "Handyman" is *your best worker*. It frees larger machines for high-capacity work elsewhere on the project. Here are just a few "reasons *why*" . . .

Self-loads or push-loads

On small jobs, "D" self-loads up to 5½ pay yards in most dirt. For larger jobs, "D" is push-loaded to 8 yards in less than a minute.

Hauls and returns are made at high speeds. On long hauls, output is usually *double*, or even *triple*, that of crawler-scrapers. Spreading and grading is fast, yet controlled to within 1 inch . . often eliminating need for special equipment to handle finish-grading afterwards.

"D" travels anywhere

Rubber-tired "D" goes anywhere . . . at speeds to 29.5 miles per hour. "Handyman" roads itself, needs no trailer, no planking, to cross blacktop or tracks. Low-pressure pneumatic tires do not damage paved surfaces, resist wear.

Works year 'round

Behind the same 2-wheel "D" prime-mover you can interchange scraper for rear-dump hauler, side-dump hauler, flatbed, or lift-and-carry crane. Dozer blade can be mounted in front. Electric generator can power tools or lights in emergency.

With all these optional tools, your equipment investment can be held to a minimum — with your prime-mover earning dividends all the year 'round. Ask for specifications and performance figures on the 9-yd. "D Handyman".

D Tournapull's manueverability pays off on jobs where the work area is crowded or congested. Unit easily works around trees, boulders, and structures of all types.

D Tournapull's scraper interchanges with Rear-Dump hauler behind same prime-mover, for hauling shovel-loaded materials at low cost.

DP-1476-DC-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

For more facts, use Request Card at page 18 and Circle No. 358

Straw and asphalt emulsion are blown in a mixture a distance of about 120 feet from the truck over a slope on a section of the West Virginia Turnpike.

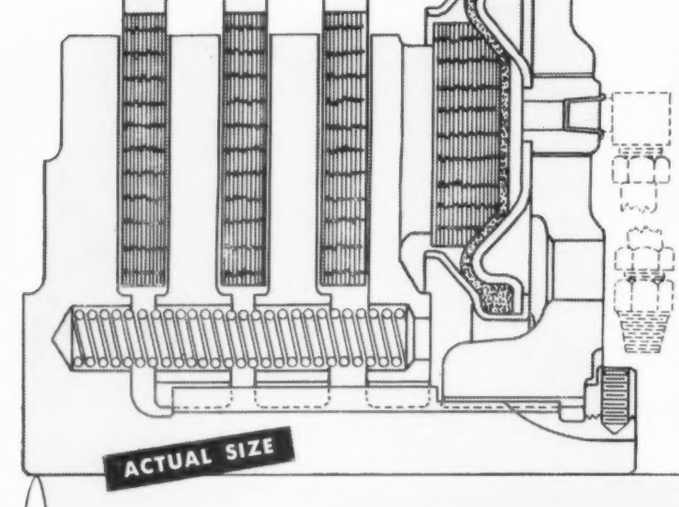
Built-in roadside developmen

This is the sixth in a series of seven feature articles, each complete in itself, on various aspects of roadbuilding. The articles were written specially for the ROAD SHOW DAILY, published by CONTRACTORS AND ENGINEERS magazine during the 1957 Road Show. They are being reprinted here, by request, for those who missed the Road Show. Each of the articles was written by a key figure in the roadbuilding industry.

Roadside development, now acknowledged by highway engineers to be one of the most important items in the construction of our expressways and freeways, is finally receiving the respect and attention it deserves. Highway engineers realize that the movement of motor vehicles rapidly, efficiently, and safely depends not only upon what happens in the traveled way, but also upon what happens in the roadside areas.

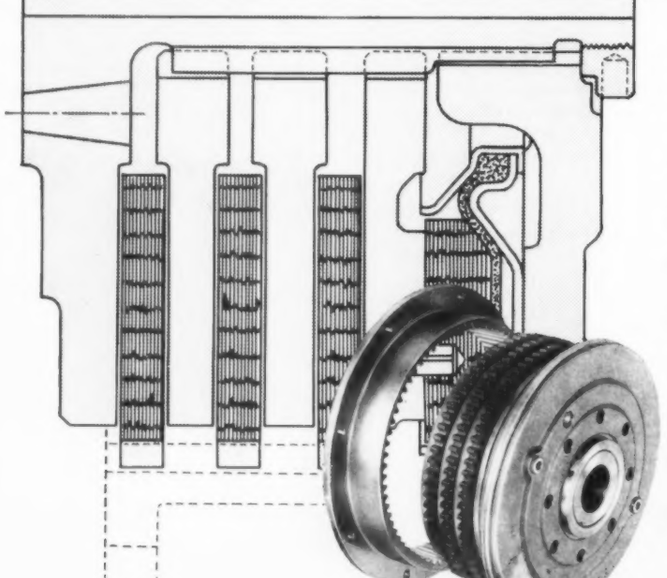
Roadside development is concerned with the conditions and consequences that result from the interaction of the traveled way and its roadsides, each upon the other. Well-planned roadsides promote safety and ease of travel, at the same time improving the physical and functional character of adjacent roadside areas.

The 1956 Federal-Aid Highway Act focused attention not only on the need to build highways at once which will stop the carnage of fatal accidents killing so many thousands today, but also on the fact that the dollars and cents needed to do the job can be made available. Now the question is, how are we going to do the job?



- New design permits highest capacity at up to 40% less cost than comparable remote controlled air clutches!
- Available in sizes 8, 10 and 11½ inches . . . in triple-plate, double-plate and single-plate construction . . . with maximum torque capacity of 3503 pound-feet.
- Exclusive cartridge-type diaphragm of long-lasting neoprene reinforced with nylon . . . eliminates leakage and provides long life.
- Provides constant torque capacity without adjustment . . . self-compensating for wear.
- Compact and rugged . . . with clutch mass properly distributed relative to friction area, providing long life on high energy loads.
- Narrow width permits replacement of old-style drum or band clutches.
- Suitable for air systems up to 130 pounds per square inch.

New LOW COST high capacity
Twin Disc Air Clutches



The new Twin Disc 8, 10 and 11½-inch PO Air Clutches are adaptable wherever the convenience of remote air control is desired. They are currently in use on rock crushers, tractor winches, pipe-extruding machines, drilling rigs, machine tools, pug mills and other equipment.

The three new sizes extend the time-tested, job-proved line of PO Air Clutches from 8 to 36 inches in diameter . . . in torque capacities to 126,600 pound-feet.

Check your next design . . . see for yourself how PO Air Clutches lend themselves to convenient, economical remote control. Write Twin Disc Clutch Company, Racine, Wisconsin.

TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES

TWIN DISC
Friction Clutches and Fluid Drives

For more facts, use Request Card at page 18 and Circle No. 359

MAYO PNEUMATIC GROUTER and "PEA SHOOTER"

Simple to Operate Highly Efficient

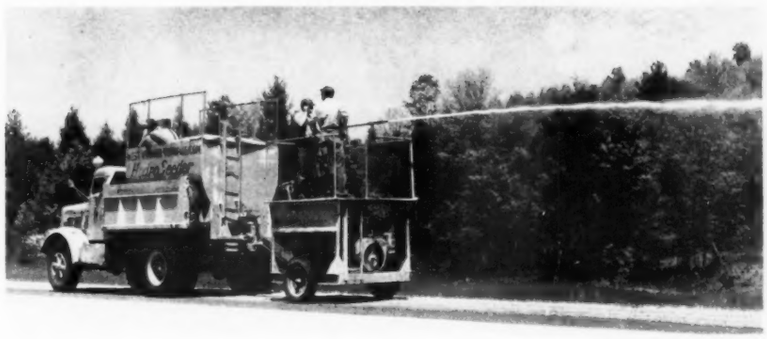
The Mayo Grouter quickly and easily places low-pressure grout in tunnels, mines, shafts, foundations, and subgrades. It also may be used to inject sodium silicate emulsions for stabilizing caving or running ground.
This versatile piece of equipment can readily be converted to a "Pea Shooter" for shooting Pea or "Birds Eye" gravel back of liner plates and back packing outside lagging plates.

Write for Free Bulletin 13 for full details and specifications.

MAYO
MAYO
TUNNEL AND MINE EQUIPMENT
LANCASTER, PENNA.

For more facts, circle No. 360

WILBUR H. SIMONSON
Bureau of Public Roads
U. S. Department of Commerce



This equipment is designed to spray seed, ground limestone, and fertilizer mixed in water over slopes up to distances of 100 feet or more.

The time has arrived to define what is meant by the terms "roadside development" and "roadside improvement." Roadside development is interpreted to describe the uncontrolled or controlled building and land-use changes along the highway. It is a term used in the broad sense, defining those areas commencing immediately outside the traveled way and including the areas adjacent to the highway; i.e., the development of roadside areas *outside* the highway right-of-way.

In the past, farms, homes, factories, and businesses, as well as recreational facilities, had direct access to all highways. Abutting property owners possessed broad rights, in many instances exercising some of those rights to the center-line of the highway. This is in direct contrast with the present modern expressway or freeway where the traveling public, rather than the abutting property owner, exercises most of the rights with respect to the traffic lanes in the interest of safe driving conditions and the welfare of the largest number of persons.

Roadway, roadside relationship

Step by step, over the past 25 years, we have learned a number of facts about the relationships between sound roadside development and highway design, construction, and maintenance. There is increasing recognition of these relationships by traffic engineers. These design problems call for new vision and technical skill. In expanding state highway programs the landscape architect is now recognized as a necessary member of the team working to improve appearance and operation, to reduce slope erosion, to abate traffic noise, and to develop practical plans, specifications, and estimates for roadside improvement.

Access control is mandatory on all highways of the 41,000-mile Interstate System, and may be explained as "planned access." Such "planned access" permits vehicles entering or leaving the highway to do so on facilities designed for both safe and easy merging with and emerging from the through traffic lanes. Experience with existing "planned access" highways has demonstrated that accident rates are reduced about two-thirds. The reader interested in this phase of the roadside problem is referred to the

(*Continued on next page*)

Here's tandem push-power in one easy-to-spot machine handled by one operator

Big B Tournapull, with 27-yd. Fullpak* scraper, picks up heaping load *fast* with Twin-C pushing. New tandem-engine pusher provides enormous power, plus speed to match rubber-tired scrapers. Owner benefits from economies of one-machine operation.

Big push-plate of Twin-C is raised and lowered by electric control. Operator can center plate on scraper push-block, to assure solid contact at all times. Once push starts, plate "floats" . . . automatically adjusts to match movements of scraper push-block.

Since the trend in earthmoving today is to bigger-yardage contracts, you are using more and more of the larger-size scrapers . . . machines of 18 to 27-cu. yd. capacity. To push-load these giants efficiently, contractors are finding it necessary to double-head their crawler pushers.

While this practice produces extra drawbar pull, it seldom proves practical. First, there is the problem of synchronizing the actions of 2 operators and 2 machines. Time is lost in positioning, and tandem crawler teams cannot effectively match the speed of rubber-tired scrapers. Finally, there's the added expense of operating the extra machine, with its extra operator.

LeTourneau-Westinghouse, alone in the earthmoving field, offers a unit that solves these problems. The job-proved Twin-C* pusher provides: a) synchronized tandem push-power, b) a speed range to match rubber-tired scrapers, c) single-unit ease in positioning, and, d) economy of one-machine, one-man operation.

Proven drawbar pull of up to 64,500 lbs.

Twin-C provides the combined horsepower output of two 210 hp GM diesels on one machine. With its 40 tons of tractive weight, its tires over 7′ high and 2½′ wide, this machine develops 64,500 lbs. of drawbar pull.

Consider, also, Twin-C's many additional advantages, besides its tandem power (a "first" in the rubber-tired pusher class). This pusher can develop speeds up to 20 mph forward, 5.8 in reverse. Air brakes on all 4 wheels provide 3,690 sq. in. of braking surface, for quick stops and fast maneuvering.

Positive, Tournapull®-type steer

There's new steering ease, too, with the Twin-C. Operator makes short turns in tight quarters, because positive power-steer is applied through geared kingpin at base of yoke. It's the proven LeTourneau-Westinghouse steering principle used successfully on Tournapull-Scrapers all over the world. Front and rear sections line up automatically when steering power is shut off.

Power-lift on push-plate

Twin-C's big, electric-controlled push-plate is easily raised or lowered by operator to make on-center connection with every push-block. Once push starts, plate "floats" . . . automatically keeps contact with scraper until bowl is filled.

If tandem pushing is becoming the accepted practice on your spreads, find out more about the new Twin-C. Call or write for full specifications on this powerful pusher.

*Trademark TW-1133-DC-8

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

For more facts, use Request Card at page 18 and Circle No. 361

IT's NEW --- The Campbell Sliding Cab

for the models HU, HH, and HO

"Payloaders"!!!

This sturdy, modern design offers features long desired by "PAYLOADER" operators, among them—Sliding top, ball bearing mounted on steel channel—Rubber seals to insure weather tightness—Permanently mounted access ladder —Rear view mirror—Tinted safety glass windshield and skylight.

Investigate this completely new design in "Payloader" Cabs by calling your "Payloader" distributor, or contact

CAMPBELL DETACHABLE CAB CO.
WAUCONDA, ILLINOIS

For more facts, circle No. 362

Hydraulic seeding and fertilizing equipment operates along a mulch-covered slope in one of the typical operations in roadside development.

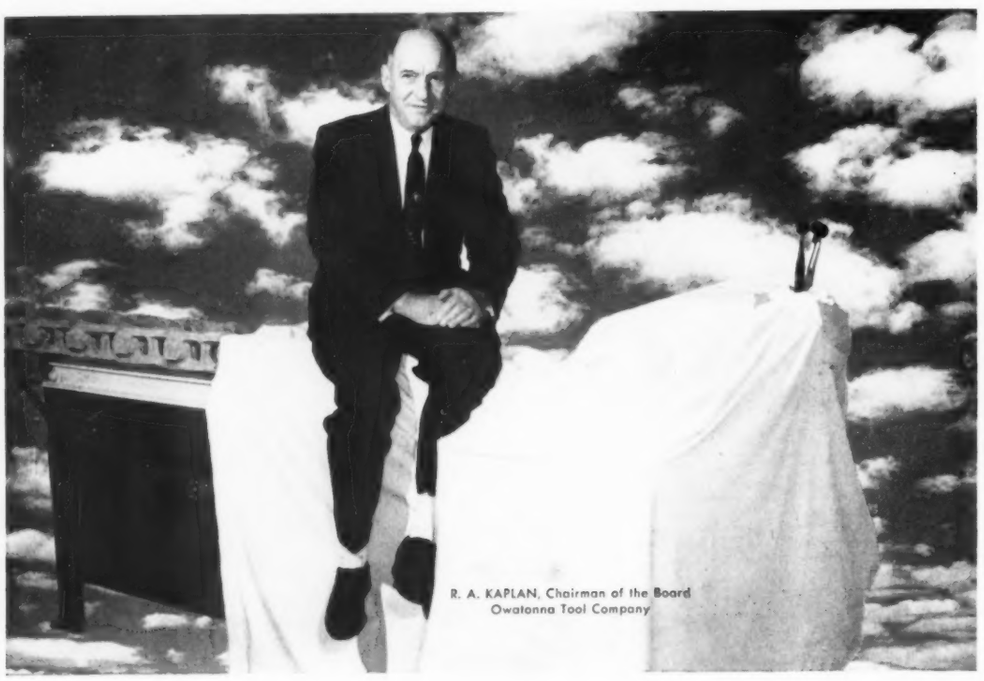
(*Continued from preceding page*)

American Automobile Association booklet, *Roadside Protection: A Study of the Problem and Suggested Approaches to Betterment.*

The interpretation of the term "roadside improvement" is not as broad as that of "roadside development." It is limited to the physical and functional improvement of typical and special areas within the highway right-of-way—that portion of highway work concerned with the preservation of landscape features and materials, protection against erosion, grading and planting, construction of safety turnouts and rest areas, and all related "improvements" designed to increase safety, improve appearance, and reduce maintenance.

New design standards, not only from the standpoint of traffic but also from the standpoint of esthetics, should be used. Overstandardization should be avoided. Roadsides should not be standardized because roadside variety and change are the essence of interest and attraction for motorists.

Standards adopted state that all interstate highways shall meet minimum standards for roadside grading and right-of-way width, and shall be designed to accommodate the types and volumes of traffic forecast for the year 1975. Side slopes should be 4 to 1 or flatter where feasible, and not steeper than 2 to 1 except in rock excavation or other special conditions. To accommodate normal roadside requirements for shoulder, gutter, and buffer planting, a width of 60 feet on each side of the pavement is desirable. When a highway has been well located, with the alignment and grading adjusted to fit the topography and critical conditions, we have laid the foundation for the roadside as an integral and functional part of our highway system. Adjustment by skillful designers of the location of widely-separated roadways can reduce the cuts and fills, with the least possible disturbance or damage to streams, trees, and other natural features, thus reducing the amount of erosion control work and annual maintenance costs. These savings tend to compensate the cost of roadside work which may range from a low of 1 or 2 per cent upward to 6 or 8 per cent of the total cost of rural and urban highway construction. When it is considered that an average cost of 3 or 4 per cent for roadside work represents but about one year's interest on the total investment in highway construction, this



R. A. KAPLAN, Chairman of the Board
Owatonna Tool Company

"Our new OTC track pin press is the most revolutionary advance in the past 20 years"

"We talked right to the men who use and service heavy construction equipment. We found out what they needed . and wanted. Then we designed this new OTC track pin press . . . a brand-new design based on an entirely new principle.

"This isn't a 'beefed up' small press. Instead, it's new from the ground up . . . specifically designed to handle the heaviest and biggest tracks now in use . . . or even contemplated.

"Right now I can't tell you the details about this new press, but I can say it's far faster, safer and easier to operate than any track pin press ever built! . . . and that includes our other OTC presses. In actual tests with this press we've taken a track down to pins, bushings and sidelinks almost twice as fast as it's ever been done before . . . no matter how rusted or 'frozen' the parts!

"Our official announcement is still a few weeks off, but I want to give you a hint of what's coming. Take it from me — this new press is well worth waiting for. Don't buy any press until you see the new OTC track pin press in action.

"Fill in the coupon below and send it to me today. I'll see that you get complete information just as soon as it's available."

RESEARCH · ENGINEERING · DEVELOPMENT — OTC

MAIL THIS COUPON NOW!

OWATONNA TOOL COMPANY
381 Cedar Street Owatonna, Minnesota
World's Leading Manufacturer of Hydraulic Maintenance Tools

MR. REUBEN A. KAPLAN, Owatonna, Minn.
O.K., Rube — Put me down for advance information on the NEW OTC TRACK PIN PRESS.

NAME_____
FIRM_____
ADDRESS_____
CITY_____ STATE_____

I have a track pin press now YES ☐ NO ☐

For more facts, use coupon, or Request Card at page 18 and circle No. 363

nominal cost would appear to be a low rate of protective insurance on the public investment in highways.

Use of aerial surveys

We now have tools available with which to solve highway design problems. Forty-six states have indicated that they are using aerial photography in varying degrees. Location and design engineers have found that engineering design, and landscape design, can be coordinated more effectively when aerial survey methods are used. Aerial photographs and topographic maps have proved their value in the reconnaissance and planning stages, and in the determination of right-of-way to be acquired. Aerial survey techniques have facilitated the application of the "spline-line" method of location and alignment.

Flexibility in a free-flowing, pleasing alignment, with curving one-way roadways of divided highways widely separated and often at different levels, effectively avoids monotony and resultant driver fatigue. Glare of oncoming headlights is not then a problem, especially when trees and other existing growth can be saved between the opposing traffic lanes.

Appropriate planting can also relieve the monotony of long, straight, stretches by introducing variety and interest in the roadside and skyline scenery, adding much to the pleasure and safety of motoring. At interchange areas especially, the use of large-scale photography and of topography obtained by photogrammetric methods permits greater flexibility in blending the design of ramps and the grading of earth slopes into the existing contours. Engineers can use these tools to counteract the hypnotic effect of "effortless" driving, which is known to cause so many accidents.

Planning of right-of-way must anticipate changes in the use of abutting land. Unless the potential changes from rural to urban uses are taken into account, drainageways may need to be redesigned because of increased runoff of surface water, as woodlands are cleared and replaced by plowed lands, or crop lands are replaced by residential areas. Such drainageways should be protected against erosion.

When grading begins, trees can be saved and protected against damage by construction equipment during earthwork operations. Stone and rock materials should be salvaged (when available and needed) for use in protecting road embankments against stream erosion, especially at bridge approaches and where streams parallel the highway. It is obvious that all rock, earth, or other materials which in any way interfere with stream flow should be removed at the close of new highway construction.

Mechanical equipment is used to flatten, round, warp-cut and fill slopes, eliminating the old costly hand-labor practice of "sandpapering" slopes. Increased use of 3 to 1 and flatter slopes is desirable. On flat slopes, roadside mowing can be done by machine at a much lower cost, and powered snow plows and blade graders can also be easily operated during maintenance work on highways, turnpikes, and streets. A comprehensive report on this phase was published in the 1950 Report of the Committee on Roadside Development. Included were special papers presented at the twenty-ninth annual meeting of the HRB.

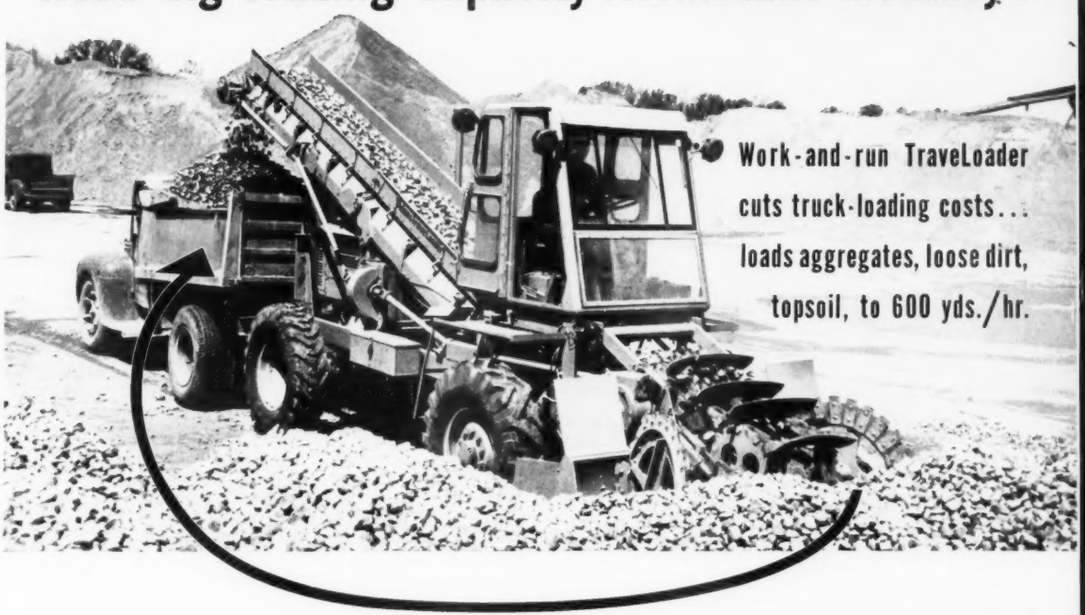
How are we going to get this job done in the shortest time possible? There is a shortage of competent engineers and no time to train them. What do we do next? The only thing is to adopt new technological methods consistent with sound project control principles to make possible more effective use of manpower, not only of engineers but also of engineering aides and other personnel involved in supporting activities.

Of outstanding interest in the field of earthwork computations are the "contour grading plan" under development in California and the mechanized procedure development in Oregon.

The Bureau of Public Roads has assigned engineers to study the application of high-speed electronic computers to highway engineering operations and to consult with industries as to the use that has been and can be made of these machines. The initial effort of the Bureau engineers, therefore, relates to the combined use of photogrammetry and high-speed electronic digital computers in location, design, and construction work involving the economics of earth movement.

Recognizing the need for new roadside standards because of changes in the scope and type of highway de-

Need big loading capacity?...instant mobility?



TraveLoader can efficiently work all day at a single location, loading trucks one after the other... or it can quickly maneuver and "run" between loadings at 26.7 mph, handling many scattered assignments in a day's time.

If you handle big yardages of gravel, crushed stone, sand, slag, topsoil, or surplus dirt, you'll reduce your truck-loading costs with an Adams* TraveLoader that will load up to 600 yds./hr., depending upon materials. And when loading from scattered stockpiles or loose materials beds, 26.7 mph TraveLoader loads fast and economically ... saves extra time and money by cutting expensive work-stopping delay in moving.

Truck-a-minute loading

LeTourneau-Westinghouse-built TraveLoader gathers and loads all kinds of loose, granular materials from stockpiles... from windrows formed by graders... from natural banks. It heaps trucks evenly and fast... continuously discharges full load of material off belt running at 450' per minute. With a 40 to 60-second truck-loading cycle, TraveLoader handles big jobs fast... keeps work projects on schedule... cuts truck waiting-time... holds your loading and hauling cost low.

Loads in continuous motion

Unlike front-end loaders, TraveLoader works without wearing turns, back-ups, or other waste motion... does not need to push against a solid pile to load cleanly. Loader can move forward at any of 5 working speeds (25 ft. to 167 ft. per min.)... can adjust feeder to suit slope of shoulder. Machine gathers and conveys material from any width up to 8', and discharges evenly into trucks. Conveyor is hydraulically adjustable to best truck height, for minimum spillage and dust-blow.

Rear or side delivery

Standard TraveLoader conveys material to the rear... loads on road shoulders, in one lane, over backfilled excavation, almost anywhere ... minimizes obstruction to traffic. With addition of reversible cross-conveyor (optional), it loads parallel trucks at either or both sides — fast as haulers can position.

Handles many jobs in one day

Rubber-tired TraveLoader has 5 travel speeds, moves quickly from job to job at speeds to 26.7 mph... from windrow, to stockpile, to bank work. Positive, convenient controls make loading simple, make maneuvering and traveling as safe and easy as driving a truck. Choice of diesel or gasoline engine. Machine weight approximately 16,700 lbs.

We'll be happy to send you complete information and names of users working TraveLoader on loading projects similar to yours.

Cross-conveyor (optional), shiftable left and right, directs material to trucks at either side ... speeds loading, cuts positioning time, balances load... boosts haul-trips per day.

*Trademark TL-1462-DC-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

For more facts, use Request Card at page 18 and Circle No. 364

velopment, the Bureau of Public Roads has completed a study of standard specifications relating to roadside improvement operations in 48 states, the District of Columbia, Hawaii, and Puerto Rico. The study summarizes materials, methods, and equipment used in erosion control and other roadside work now incorporated into specification items, and brings out a number of important facts. For example, except in one or two states, standard specification books for seeding and mulching items fail to describe materials and methods used with new power equipment. There seems to be quite a time lag between new developments in field operations and the inclusion of such mechanized methods of seeding and mulching in standard specifications. Some states take care of this time lag temporarily by special provisions. When results of this study are printed and circulated as a report to highway engineers it should help the states to include the best roadside improvement materials and methods in their standard specifications.

Mulching is combined with seeding in 23 states, but there is a variation in seeding and mulching specifications. The rates of seeding in different states range from 20 to 175 pounds of grass seed per acre. The trend is definitely toward a lower rate per acre. Seeding tests on representative roadside slopes in Connecticut are described in the 1956 Report of the Committee on Roadside Development (HRB Publication 419, page 61). Since these tests were made, all seeding there has been at the rate of 40 pounds per acre.

Likewise, rates of mulching vary from 2 to 4½ tons of straw mulch per acre. The trend is toward a rate of one-half or two tons of straw per acre. From 75 to 100 gallons of asphalt (emulsion or cutback) per ton of straw has proven satisfactory under most field conditions as a binder for the mulch. It is reported that fine-stemmed straw requires more asphalt per ton than coarse-stemmed material. Hay requires more asphalt binder than straw. Under very windy conditions on the western prairies, a rate of asphalt application as high as 350 gallons per acre has been used to hold fine hay-mulch in place. Tests under way in Texas should answer this question of the most satisfactory rates of asphalt and mulch application under these conditions.

In Virginia, mulching before seeding has been very successful. Slopes were mulched during winter and then in the spring seed was placed over the mulch. When slopes were immediately mulched and seeded following finish grading, soil preparation was not necessary.

Mechanization

Highway landscape architects and engineers and others responsible for roadside improvement in the state highway departments are reducing costs through the substitution of mechanization for hand labor. Twenty-two states report using 34 different types of roadside equipment, the four most frequently mentioned being: (1) mulch applicator (blower); (2) mulch stabilizer (rotary soil stabilizer); (3) seed and fertilizer spreader (drill type), and (4) seed and fertilizer sprayer (hydraulic type).

All states reported that the use of mechanized roadside equipment resulted in a saving of man-hours and money, enabling them to do work that could not otherwise have been done because of labor shortages. Illustrations and descriptions of various types of roadside equipment were published in *Mechanization of Roadside Operations* (HRB Special Report 16, Publication 289). Since this report was published, improved mechanized mulching equipment for blowing mulch on high slopes has been manufactured and is now available in most places.

In the past, hay or straw mulch was usually anchored in place by various methods, such as stakes and twine, stakes and wire mesh (chicken wire), a light cover of soil, or a cover of saplings or brush. More recently, the hay or straw mulch has been combined with asphalt and blown over slopes in one mechanical operation that requires a "sticky" coating of asphalt emulsion to tie down the mulch.

Although a wide range of materials may be used as mulches, it has been found that straw or hay mulch may be spread by machinery faster and more uniformly than by hand. The latest method of vegetative mulching with improved mulch blowers spreads the mulch material evenly over the roadside slope with an asphalt coating to hold the straw in place on the ground. After the asphalt-coated mulch has been applied, seed and fertilizer are then applied over the mulch with hydraulic seed and fertilizer spraying equipment. This overseeding method allows the seed and fertilizer in the water solution to pass through the wet mulch to the soil and to be held in place. Washing of the seed down the slope is thus prevented and "walking" over the slope is eliminated. Hydraulic seeding and fertilizing can also be continued during light rains and when the soil is wet, since no equipment touches the soil to cause packing or puddling. Rapid low-cost mulching and seeding operations immediately following grading of slopes has reduced erosion control costs about 50 per cent.

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Functional planting

Trees and shrubs are planted for specific purposes such as erosion control, aid in the direction of traffic, and abatement of traffic noise. Principles regarding the relationships of plant growth to highways and to traffic on highways from a landscape-engineering point of view are listed in *Planning and Management of Roadside Vegetation: An Analysis of Principles* (HRB Special Report 23, Publication 414). This 1956 report will serve as a check-list for reference use when planning or managing vegetation along highways, including parkways and arterial routes, both old and new, and in all kinds of situations.

Highway landscape development is concerned with the complete improvement of the highway right-of-way and its environment—those factors that make for safe and pleasant motoring as well as pleasant residential living along the highway. Roadside improvement is, therefore, concerned with the abatement of highway noise in relation to the uses of property abutting the highway. Readers desiring to keep informed on current trends and achievements in the field of outdoor noise and ways and means of solving this problem of traffic and land-use should refer to pages 41–44 in the latest Report of the Committee on Roadside Development published by the Highway Research Board in November, 1956 (Publication 419), and to Highway Research Board Bulletin 110, issued in December, 1955 (Publication 363) containing three separate studies on this problem.

Complete highway design is concerned with a two-fold problem: not only the safe movement of vehicles but also the safe stopping and parking of motor vehicles well off the traveled way. Safety turnouts and rest areas are needed for use by commercial truck travelers and tourists alike. Many states have developed roadside parks and waysides as rest areas, showing the locations on their published highway maps.

Safety turnouts and rest areas should be skillfully designed, especially on controlled-access highways and freeways, because drivers are not permitted to stop on shoulders except in emergencies as when vehicles suddenly break down, drivers become drowsy, or unusual weather conditions occur. Sites should be carefully selected as to location and natural advantages of topography and scenic qualities. Acquisition of necessary land outside normal width should be part of the right-of-way taking.

Safety turnouts and rest areas should be designed as a unit for economical construction. The spacing of safety turnout and rest areas should conform to a state-wide master development location plan, their frequency of spacing being about one-half hour's driving distance apart.

A timely discussion of this general design problem will be found in the latest Report of the Committee on Roadside Development (Publication 419, pages 57–60). Desirable factors which contribute to safer, more adequate and more attractive highways will also be found in the illustrated, 12-page reprint by the Highway Research Board, *Expressway or Parkway: Desirable Design Factors Underlying Highway Construction*. This 1955 report may serve as a guide to highway administration of roadside development during the planning stage of any highway improvement program.

Herbicides for roadways

A new "tool," herbicides, can be useful in providing a greater degree of safety, improved roadside appearance, and economy of maintenance, but it must be used with caution.

State highway departments are showing increased interest in the field of weed-control herbicides. Because of the relative newness and complexity of herbicides, the general subject of herbicides for roadsides is part of the 1956 Report of the Committee on Roadside Development published by the Highway Research Board. This latest committee publication contains detailed reports on chemical weed control and the herbicide programs in four states.

Another recent publication on this subject is Technical Bulletin No. 218, *"Pesticides" Place in Roadside Main-*

Sources of some publications on roadside development mentioned in this article are:

The American Automobile Association, 1712 G St. N. W., Washington, D. C., *Roadside Protection: A Study of the Problem and Suggested Approaches to Betterment.*

The Highway Research Board, 2101 Constitution Ave., Washington, D. C., 1956 Report of the Committee on Roadside Development; *Mechanization of Roadside Operations; Planning and Management of Roadside Vegetation: An Analysis of Principles;* and *Expressway or Parkway: Desirable Design Factors Underlying Highway Construction.*

The American Roadbuilders' Association, World Center Building, Washington, D. C., *"Pesticides" Place in Roadside Maintenance.*

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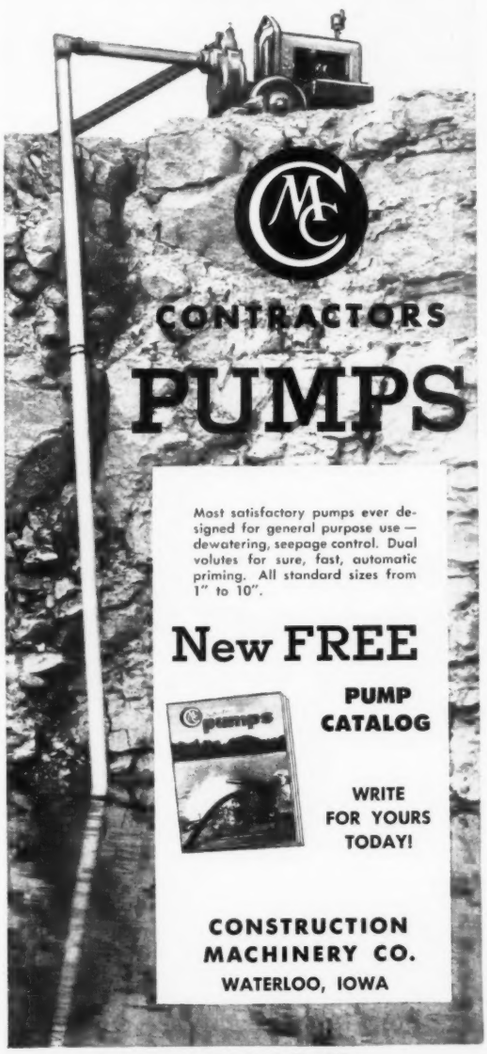

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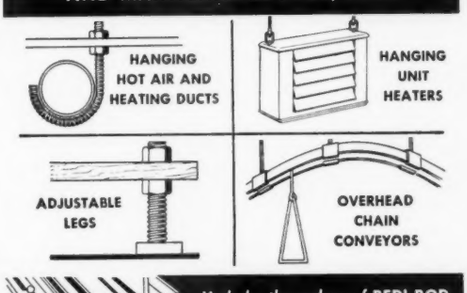

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‹Continued from preceding page›

tenance, published in 1956 by the American Road Builders' Association. This bulletin lists the most widely used chemical substances for controlling weeds and brush under specific conditions, with types of insecticides and fungicides. Safety factors for using pesticides along roadsides are outlined, and common herbicide terms are defined in a practical and usable manner.

Roadsides and esthetics

Highway builders should take advantage of the natural landscape and the topography. In spite of the magnitude and urgency of the program, esthetics come in for their share of attention both from planners and designers, as well as from most of us who drive. Much can be done to insure eye-pleasing results. Bridges architecturally right, with attention directed to line and form, cost no more.

Streamlined highways designed as separate one-way roads may better fit the roadways with their accompanying roadsides into the landscape and thus reduce construction cost. Built-in roadside improvement reduces erosion and maintenance costs. When roadsides and medians are judiciously planted, glare from oncoming headlights is reduced so that greater ease and relaxation is enjoyed by drivers, and the roads have a pleasing appearance.

In the final analysis, we must look forward a decade or more. Once the job is done, our work will be judged by what the public sees and feels. The speed of construction or the difficulties encountered and overcome will soon be forgotten by the public.

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BUILT TO SPREAD THE BIG ONES!

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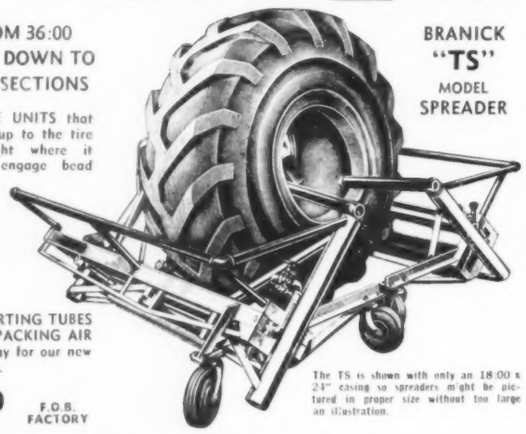

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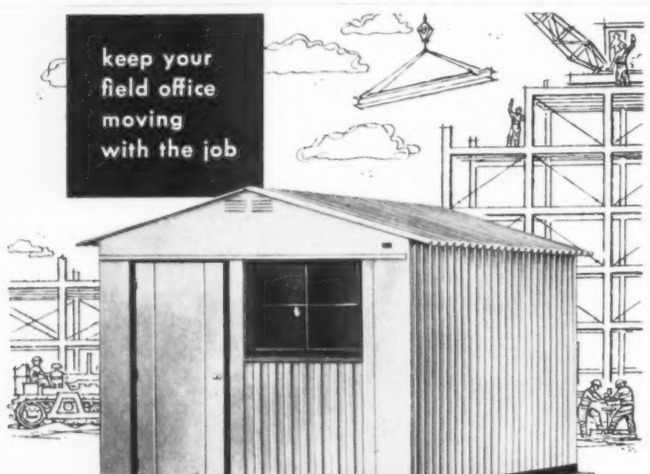
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Heavy gauge steel channel skids integral with floor for easy relocation intact.

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Fully prefabricated, the all-steel Handy Hut erects quickly at your job site without cutting, welding or bolting. When skid mounted, the Handy Hut can be easily dragged or winched for relocation to the exact spot you need it. Choice of side and end panels, partitions and accessories offers complete versatility. By using several partitions and access doors along the side, several trades can be housed in separate rooms under one roof. Size: 10′ x 8′; longer lengths available in multiples of 2′.

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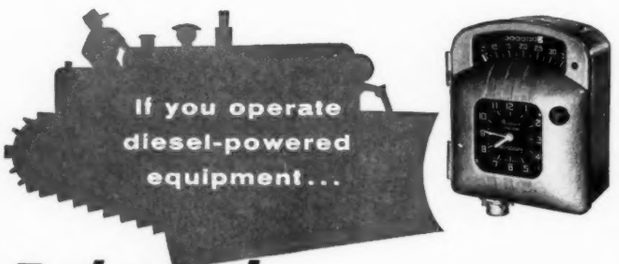

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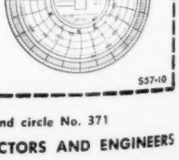

S57-10

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Some old Fruehauf trailers that have served their time on the highway get a new lease on life as portable offices. Less expensive than job-built units, they are sturdy and easily converted into either offices or storage units.

From second hand trailer boxes to first-rate offices

Old trailer equipment is being given new life by MacDonald, Young, & Nelson, San Francisco, Calif., which is using "boxes" from second hand Fruehauf trailers as portable offices and tool sheds at job sites. Right now, the firm has 15 converted trailer boxes in use on jobs in California and Nevada.

The cost of the units is under $500 each, which adds up to quite a saving over the $500 to $800 offices and tool sheds which the firm used to build at job sites.

This cost, plus the fact that the contractor-built wood structures did not hold up for more than three or four jobs, set the firm to looking for a practical substitute.

Unlike the contractor-built structures, which did not stand up under the stresses of being jacked up and moved from job to job, the trailer-box units are practically indestructible.

Converting the trailer boxes into portable offices is a simple job. Only windows, flooring, and wiring have to be installed. When the trailer boxes are to be used as tool sheds, the conversion job is even less difficult.

When the company has a short-term job on hand, the boxes are lifted to the deck of a flat-bed trailer, either by fork lifts or hydraulic jacks. If the job will take some time, the trailer boxes are set on the ground for semi-permanent installation.

Though the contractor is saving about $300 on the initial cost of each unit, as compared with the cost of job-built units, the over-all saving comes to much more. The company used to build from 10 to 15 portable offices and storage units each year, at a total cost of $4,000. This is an annual outlay that has been eliminated, since the sturdy trailer boxes can be used from year to year.

The company has one other tip for contractors who might want to adopt the idea: get old refrigerated trailers. These are well insulated and minimize air conditioning problems in summer and heating problems in winter.

P. S. Painting the trailer boxes with company colors is a good way to advertise the firm.

NSPE elects president, six vice presidents

Garvin H. Dyer has been elected president of the National Society of Professional Engineers, to succeed Robert J. Rhinehart. Dyer is past president of the Missouri Society of Professional Engineers and the Mid-Missouri Section of the ASCE.

The organization also elected six regional vice presidents and a treasurer. The new vice presidents are: A. H. Kidder, Northeastern region; John B. McGaughy, Southeastern region; Harry G. Kennedy, Central region; W. L. Hindermann, North Central region; Clark A. Dunn, Southwestern region; and L. R. Durkee, Western region. Russell B. Allen was elected for a tenth term as treasurer.

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Here's a new concept in lightweight earthmovers . . . a finishing tool which actually makes a prime mover of your tractor. The Danuser Terra-Scoop does everything the big earthmovers do, *in miniature*. Slices off high places, carries dirt to low places, dumps, scarifies . . . all hydraulically, without long ropes or levers . . . at a cost of only a few pennies per operation. Quickly reversed by changing four bolts.

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manufacturer memos

Master Vibrator appoints sales manager, assistant

Charles Raper has been appointed sales manager of the Master Vibrator Co., Dayton, Ohio. Raper, who was previously in charge of master branch sales, will now be in direct charge of sales programs here and abroad for all of the company's products.

Raper will be assisted by Charles Roudane. Roudane was formerly regional manager for a three-state area in the Southwest.

William A. Meiter, vice president of employee relations and organization development of the Worthington Corp.

Worthington elects Meiter new vice president

William A. Meiter has been elected to the newly created post of vice president of employee relations and organization development by the Worthington Corp., Harrison, N. J. All corporation activities in employee relations and organization development—personnel policies, practices, compensation, recruitment, education, training, communications, and union relations—will be brought under Meiter's direction.

Meiter's former post of general marketing manager will be taken over by A. William Fraser, commercial vice president in charge of the district sales offices at Chicago, Denver, Kansas City, St. Louis, and Minneapolis.

Stokes new sales manager for Mobile Drilling, Inc.

Mobile Drilling, Inc., Indianapolis, Ind., has appointed James B. Stokes sales manager. He will be responsible for sales policy, promotion, and training. His immediate objective is the expansion of Mobile's dealer-distributor network.

James B. Stokes, new sales manager for Mobile Drilling, Inc.

A member of the firm for the past three years, Stokes has been an engineer for the firm, chief engineer in charge of research and development, plant manager, and sales engineer.

Charles D. Clark, national sales manager for the Tusky Hoist Division, Tubular Structures Corp. of America.

Tubular Structures names national sales manager

Charles D. Clark has been appointed national sales manager for the Tusky Hoist Division, Tubular Structures Corp. of America, Los Angeles, Calif. In his new position, Clark will coordinate the sales activities of the firm's distributors. He will also work with the company's dealers in the United States and Hawaii.

Baxter to head new Noble branch office

Robert L. Baxter, formerly of the Los Angeles office of the Noble Company, manufacturer of mobile and stationary cement-aggregate batching plants, is in charge of the company's new branch office in Dallas, Texas. The branch is at 2512 W Mockingbird Lane.

Other personnel changes in the company, which has its home office at Oakland, Calif., include the appointments of Robert C. Clark as

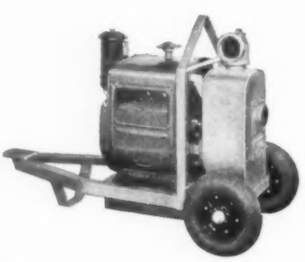
the problem

and the answer

This contractor used a 4" McGowan 30-M pump to control water output of a continuously flowing underground spring, eliminating flooding and allowing work to continue.

An underground spring may or may not be your problem, but whatever the trouble, your mind will be at ease when a McGowan pump is on the job. Eliminates down-time by dependably handling any situation.

McGowan builds a full line of self-priming centrifugal contractor's pumps, with exclusive spring-loaded seal lubrication for longer wear. Sizes range from 1" to 8" suction-discharge.



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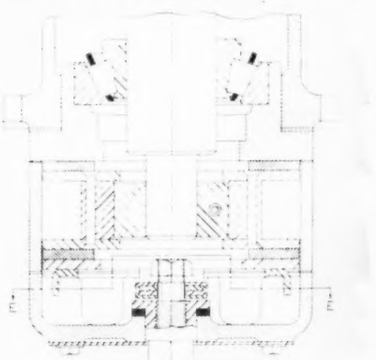

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BRADEN WINCHES are made for back-of-cab and front mounting and range in capacities from 6,000 to 100,000 pounds. Specify BRADEN Winches . . . and be sure!

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In service around the world

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sales promotion manager at Oakland. Arthur B. Kinley as regional manager of the Cleveland office, and Frank Quinn as Pacific Northwest regional manager at Seattle.

Right to left, Adrien F. Busick, Jr., the new executive vice president and general manager of Marion Power Shovel Co., and Maurice V. Cornell, new vice president of large-machine sales for the firm.

Marion Power has three new vice presidents

Adrien F. Busick, Jr., has been promoted to executive vice president and general manager of Marion Power Shovel Co., Marion, Ohio. Busick will have complete charge of all functions and operations of the plants at Marion. He joined Marion Power Shovel in 1929.

Maurice V. Cornell has been promoted to vice president of large-machine sales, succeeding David E. Rizor, who retired. William R. LeMasters, secretary-treasurer, has been made a vice president.

Murphy-Phoenix elects

M. J. Murphy has been elected president of the Murphy-Phoenix Co., Cleveland, Ohio, manufacturers of concrete-curing compounds and other specialty compounds. Murphy has been vice president of the firm since 1946.

The company also appointed Jack J. Scanlan director of sales of compounds to the roadbuilding industry.

Blaw-Knox appoints

Harry A. Collins has been named production coordinator for Fabricated Products Operations, Blaw-Knox Co., Pittsburgh, Pa. For the past nine months, Collins has been assisting with production control at the firm's Buflovak Division, Buffalo, N. Y., and for an interim period served as acting manager of manufacturing at the division.

Reo Motors appoints

John S. Joyce has been appointed by Reo Motors Division, White Motors Co., Lansing, Mich., to the newly created post of branch business manager for the Midwest region. In this position, Joyce will be responsible for and have authority over all functions directly pertaining to the operational activities in the ten factory-owned branches of Reo's Midwest region.

Wayne E. Emery has been named manager of the company's St. Louis, Mo., branch.

Mitchell new Eastern sales manager for LeT-Wesco

LeTourneau-Westinghouse Co., Peoria, Ill., has appointed D. H. Mitchell Eastern sales manager. From headquarters at the firm's home office, Mitchell will be in charge of operations of the company's Eastern sales division.

D. H. Mitchell, the new Eastern sales manager for the LeTourneau - Westinghouse Co.

Mitchell replaces James A. Vincent who resigned to become vice president and general manager of the Adams Construction Equipment Co., a new LeT-Wesco distributorship in Florida.

O. C. Zachary, former service engineer for the firm's Eastern division, has been promoted to district sales representative in Virginia and North and South Carolina. Zachary takes over Mitchell's previous position.

Robert G. Allen, new vice president of the Bucyrus-Erie Co.

Robert Allen elected vice president of B-E

Bucyrus-Erie Co., South Milwaukee, Wis., has elected Robert G. Allen vice president of the firm. Allen was previously president of the Pesco Products and Wooster divisions of the Borg-Warner Corp. Before joining Borg-Warner he was vice president of the Great Lakes Carbon Corp., and general manager of its electrode division. Prior to that he was president of the Duff-Norton Mfg. Co.

Waukesha Motor news

Waukesha Motor Co., Waukesha, Wis., has named Clarence W. Hahn production manager, succeeding Glenn R. Evans, who retired. Hahn joined the firm in 1944 in the production department. Since that time, he has been active in all phases of production work—inventory control, stores control, scheduling, etc.

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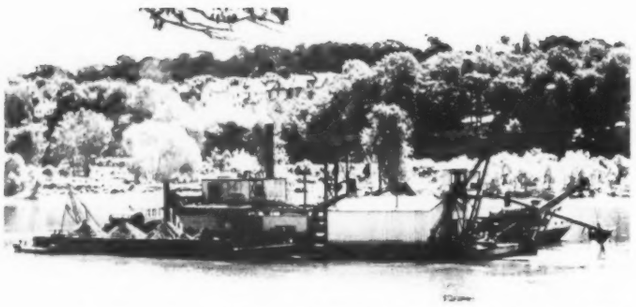

The "Cappy", a 1½-cubic-yard dipper bucket dredge, at work on the Allegheny River, has solved a number of operating problems for Oil City Sand & Gravel Co., Oil City, Pa. Built by Ellicott Machine Corp. on a company-owned hull, the dredge handles large rocks and works to a 23-foot depth. Screening and washing units handle the material aboard the dredge, and sand and gravel are conveyed to separate barges.

Firm's output of river sand, gravel doubles with dipper dredge on job

A new 1½-yard dipper dredge on an old 35×130×5-foot hull of Oil City Sand & Gravel Co., Oil City, Pa., is solving a big problem for the company.

Until the new dredge started work, the firm operated an old bucket ladder dredge to dig material from the Allegheny River for processing coarse and fine aggregates. But this dredge could not handle large rocks in the river, and it had to move about a lot to bypass the larger rock. Also, it could work no more than 20 feet below the water.

The new dredge, built on the hull of the old dredge by Ellicott Machine Corp., Baltimore, Md., handles the rock in the river and, making fewer moves than the old dredge, has had actual production days of 850 tons in 8-hour periods.

Four basic units comprise the dredge: a complete front assembly for a diesel-electric powered dipper; hoisting equipment; an electrical dc generator; and control systems, one for the operation of the front assembly, another for the operation of the pin-up or spud equipment. The screening and washing plant salvaged from the old dredge has been incorporated into the new dredge.

Digging to a 23-foot depth, the dredge makes a pass every 70 seconds, even in exceptionally hard material. As the dipper dredge drops 1½ cubic yards of material into a dump pan, the load flows through a grizzly which separates larger stones and dumps them back into the river. Rock smaller than 8 inches is carried on a 30-inch conveyor belt to the main screen. Finished gravel from the screen is conveyed to a gravel barge on a 24-inch flat belt. Sand goes by means of a flume to a sand drag to be dewatered before being conveyed to a sand barge.

Whenever market demands warrant, material from 2 inches plus is carried from a 3-deck screen to a 10×36 jaw-type crusher. It is then returned to the main screen.

Power for the dipper dredge is provided by Cummins diesel engines driving both an ac and dc generator. One operates the main hoist, the other, the lateral swings.

Film demonstrates parts of Buck Equipment rig

A 16-mm sound, color film, "The Buck Hoisting Machine", demonstrates and shows the features of the unit manufactured by the Buck Equipment Corp.

A portion of the film describes the use of the concrete bucket which will raise 17 cubic feet of concrete to the desired level, and then dump it automatically. The film is available with either English or Spanish sound track.

Prints of the film may be borrowed from the Buck Equipment Corp., 720-X Anderson Ferry Road, Cincinnati 38, Ohio.

Four Wheel Drive expands warehouse facilities

Four Wheel Drive Auto Co., Clintonville, Wis., has added a new 8,000-square-foot building to its warehouse. The rigid-frame, prefabricated structure is of clear-span construction with concrete block walls and steel truss roof. The east wall is of steel to facilitate future expansion of the building. Part of the building will be used temporarily for sub-assembly work.

BMCO
4 SPEEDS FORWARD — SELF PROPELLED — 4 SPEEDS REVERSE
PNEUMATIC TIRED ROLLER
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Product LITERATURE

For further information on any of the literature described in the following section, circle the designated number on the Request Card at page 18.

An attractively illustrated brochure on Amdek rectangular-section prestressed concrete members for use in the construction of **bridge decks.** Available in spans as long as 100 feet, the members have been used in more than 1,000 bridges throughout the country, the literature reports. Text is amplified with photographs of members undergoing strict lab tests, as well as on-the-job shots of Amdek spans under construction.

Write to the American-Marietta Co., Concrete Products Div., Dept. C&E, American-Marietta Bldg., 101 E. Ontario St., Chicago 11, Ill., or use the Request Card at page 18. Circle No. 141.

A bulletin describing Ductube, a pneumatic rubber tubing specially designed to make possible **single and multiple duct formations** in concrete at the same time the concrete is placed, by the use of non-expendable material. According to the literature, the tubing is inflated and set in the designed position; the concrete is then placed; after the concrete has set, the tubing is deflated and withdrawn, leaving a smooth-surface bore of the required dimension.

Write to the International Prestressing Corp., Dept. C&E, P. O. Box 27082, Los Angeles 27, Calif., or use the Request Card at page 18. Circle No. 135.

A catalog describing **stress-relieved wire and high-strength strand** for use in prestressed and post-tensioned concrete members. Complete specifications and stress properties are given for Super-Tens wire and various types of strand. Photos and diagrams of the strand in use, as well as instructions on how to order complete strand assemblies for post-tensioning applications, are included.

Write to American Steel & Wire Div., United States Steel Corp., Dept. C&E, 1420 Rockefeller Bldg., Cleveland 13, Ohio, or use the Request Card that is bound in at page 18. Circle No. 156.

A brochure describing the Bucyrus-Erie Hydrocrane, said to be of special advantage in heavy prestressed-concrete **form handling** and placement of finished members. On-the-job photographs show the machine performing a variety of work.

Write to the Bucyrus-Erie Co., Dept. C&E, South Milwaukee, Wis., or use the Request Card at page 18. Circle No. 142.

A bulletin describing in detail the design of Preload prestressed **concrete tanks.** Diagrams and engineering computations are used to show the design of a typical 5,000,000-gallon tank.

Write to The Preload Co., Inc., Dept. C&E, 211 E. 37th St., New York 16, N. Y., or use the Request Card at page 18. Circle No. 155.

An illustrated catalog detailing the properties and procedures for using Stressrods, high-tensile alloy **steel bars** manufactured especially for the prestressed concrete field. Diagrams show procedures for anchoring and grouting Stressrods, and for their use in post-tensioning applications.

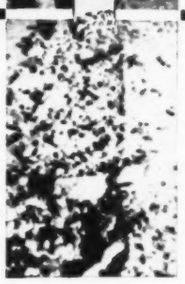
Write to Rods, Inc., Dept. C&E, 706 Folger Ave., Berkeley 10, Calif., or use the Request Card at page 18. Circle No. 151.

Literature on a new Power Midget vibrator developed especially for precast and prestressed work. Photographs show its ready application for **vibrating in narrow forms.** Specifications and possible adaptations of the unit are also given.

Write to Stow Mfg. Co., Dept. C&E, Binghamton, N. Y., or use the Request Card at page 18. Circle No. 152.

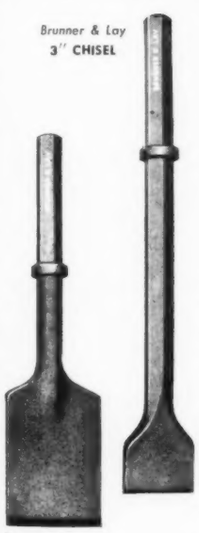
Literature describing Plastiment, a concrete **densifying compound** said to offer special advantages in prestressed concrete. The use of the product is discussed in relation to concrete workability, water requirements, setting time, and uniformity when in the

OPEN TRENCH FAST



. . . with specialized Brunner & Lay asphalt cutters

Brunner & Lay 3" CHISEL



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Breaking a top of asphalt is a fast moving job with Brunner & Lay Asphalt Cutters or 3" Chisels. They are your most efficient tools for cutting asphalt and similar materials, line cutting and scoring concrete. Their ruggedness assures you of many hours of work both before and after being properly reconditioned. Sizes to fit all standard breakers. Delivered from warehouses and dealers nation-wide. Send for NEW, complete catalog #756.

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For more facts, use Request Card at page 18 and circle No. 381

talk about production!

King-Size Kolman 42" Model 101 Loads 20-Ton Trucks in Less than a Minute

A giant producer is this 50'x42" KOLMAN 101 Conveyor-Screen Plant. On the application pictured it loaded 20-ton trucks in less than a minute while scalping out a large proportion of oversize rock in the production of sub-base material.

From three to four crawler tractors with dozer blades were kept busy in the pit feeding this hungry monster. It is equipped with dozer trap designed to facilitate dozer feeding. A complete line of other loading accessories is also available, including the feeder-trap combination, open type hopper and attached feeder, all fully portable.

The KOLMAN single-deck vibrating screen used on this plant is 9' long by 54" wide. Its design eliminates excess weight, making it possible to suspend this screening surface of over 40 square feet on the portable conveyor without extra supports. This plant can also be equipped with a double or triple-deck screen to produce various sizes of material in one operation, ideal for the simultaneous loading and screening of sand, gravel, ore, crushed rock, coal, limestone and similar materials. Spray bars can be added to provide an efficient, low cost portable washing plant.

Other features such as operator's platform, head pulley clutch, backstop, extended engine controls and rugged design of the entirely portable plant make it the most complete and practical unit of its kind now available. These outstanding features are also available on smaller Model 101 KOLMAN plants of the same design.

Single-deck vibrating screen folds under end of conveyor for transporting. No disassembly of the driving mechanism is required.

SEND for FREE literature

KOLMAN Manufacturing Co.
4922 West 12th St. Sioux Falls, S. D.
Please send free literature on—
( ) Model 101 Conveyor
( ) Model 202 Junior Conveyor

Quote ..... size or ..... capacity
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GUTH COMPANY

McPHERSON, KANSAS

SERVING THE NATION FROM ITS CENTER

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Product Literature

plastic state: heat and strength development, bond to steel, volume changes, resistance to water, abrasion and corrosion, and uniformity when hardened.

Write to the Sika Chemical Corp., Dept. C&E, 29-49 Gregory Ave., Passaic, N. J., or use the Request Card at page 18. Circle No. 137.

Literature describing Topdog **electric external vibrators**, said to be ideal for prestress work. Stressed in the brochure is the power of the unit, which has an impact ranging from 100 to 2,250 pounds. Other features discussed include simple design, with virtually no maintenance required. Details of construction; specifications; dimensional drawings; photographs.

Write to Vibro-Plus Products, Inc., Dept. C&E, Stanhope, N. J., or use the Request Card at page 18. Circle No. 160.

A booklet describing Roebling **tensioning materials** for prestressed and post-stressed concrete. Features the firm's uncoated stress-relieved strand for pre-tensioned bonded design, and galvanized strand for post-tensioned design. Also includes information on anchor fittings and bearing plate assemblies. Charts, tables, dimensional drawings, and on-the-job photographs.

Write to Construction Materials Div., John A. Roebling's Sons Corp., Dept. C&E, 640 S. Broad St., Trenton 2, N. J., or use the Request Card at page 18. Circle No. 140.

A catalog sheet describing the lightweight, small diameter Viber Models 11 and 11A **internal concrete vibrators** for use in prestressed-concrete manufacture. Performance, specification data, and other noteworthy features are presented.

Write to the Viber Co., Dept. C&E, 726 S. Flower St., Burbank, Calif., or use the Request Card at page 18. Circle No. 104.

An informative, well-illustrated little booklet on the **advantages of prestressed concrete**. Compiled from the reports of a panel of prefabricators, the literature cites and discusses such outstanding advantages as basic economy, structural balance, accelerated construction, permanence of concrete, economy of maintenance, and many others.

Write to the Union Wire Rope Corp., Dept. C&E, 2100 Manchester Ave., Kansas City, Mo., or use the Request Card at page 18. Circle No. 164.

A booklet describing Watco **steel forms** for precast prestressed concrete production. Describes in detail: square, 14-inch octagonal, and 7×10-inch sheet piling; bridge girders; multi-purpose double tees; I-beams; 10×14-inch I-joists; 4-inch flat slabs; tandem single tees; and groin-type barriers. Also includes information on the Watco cable depresser. Sketches; specifications; on-the-job photographs.

Write to the Plant City Welding & Tank Co., Concrete Form Div., Dept. C&E, P. O. Box 1308, Plant City, Fla., or use the Request Card at page 18. Circle No. 143.

A brochure describing PD concrete inserts designed for precast prestressed concrete products and structures. Drawings show how the **zinc alloy inserts** can be fastened at predetermined points to all types of forms and maintain their position without displacement during pouring and vibration of the concrete. Specifications included.

Write to Star Precision Devices, Inc., Dept. C&E, 142 Liberty St., New York 6, N. Y., or use the Request Card at page 18. Circle No. 136.

Details of a **franchise system** of precasting and prestressing concrete members to uniform specifications. Complete specifications, including safe superimposed loads in pounds per square foot for standard double tee roof and floor slabs, are given. Diagrams illustrate the manufacture and use of these prestressed units.

Write to Leap Concrete, Inc., Dept. C&E, P. O. Box 495, Lakeland, Fla., or use the Request Card at page 18. Circle No. 144.

Catalog describes the complete line of CumFlow mixers, the feature of which is the rapid-batch **mixing system** said to incorporate a pattern for the most complete and uniform mixing of concrete materials. The use of these mixers in precast and prestressed concrete work is recommended in this illustrated brochure. Specifications are included.

Write to CumFlow Mixer Engineering, Dept. C&E, 5961 Yew St., Vancouver 13, B. C., or use the Request Card at page 18. Circle No. 145.

WARREN BROTHERS COMPANY
33 CAMBRIDGE PARKWAY
CAMBRIDGE 42 MASSACHUSETTS

May 8, 1957

Blaw-Knox Company
Construction Equipment Division
Mattoon, Illinois

Attention of J. H. Cougler, Product Manager

Gentlemen:

In reply to your letter of April 30, 1957, Warren Brothers' subsidiary and associated companies now own ten Blaw-Knox Model PF-90 Pavers in the following locations:

1 - Granite Bituminous Paving Co., St. Louis, Missouri - 1956
1 - Atlantic Bitulithic Co., Richmond, Virginia - 1957
1 - MacDougald-Warren Inc., Atlanta, Georgia - 1955
2 - Warren Bituminous Paving Co. Ltd., Toronto, Ontario - 1955
1 - Warren Brothers Roads Co., Fairfield, Maine - 1956
1 - Warren Brothers Roads Co., Fairfield, Maine - 1955
1 - Warren Brothers Roads Co., Nashville, Tennessee - 1955
1 - Warren Brothers Roads Co., Columbus, Mississippi - 1957
1 - Columbia Bitulithic Ltd., Vancouver, B. C. - 1955

Most of these machines have been purchased within the last two years so our repair experience is not too conclusive. However, it does appear that repairs will be less than we previously found necessary with crawler type pavers.

We have had no serious complaints in regard to the Blaw-Knox Pavers. They have been used with many different kinds of mixtures under all types of working conditions. The rate of production, the smoothness and appearance of the pavement have been excellent. Operators have been well pleased with speed in returning to bring up a second lane; also, they have remarked about the ease in attaching screed extensions. They like the idea of fewer moving parts and the accessibility of chain and sprockets for repairs and adjustment.

Very truly yours,

WARREN BROTHERS COMPANY
R. C. Paine, Chief Engineer.

Warren Brothers' experience with ten PF-90 pavers highlights • Lower upkeep • Excellent production rates • Easy operation • Smooth, good looking pavement

Read this latest field report on the Blaw-Knox PF-90 Bituminous Paver. It's another instance of the high performance turned in by this radically different paver-on-wheels working under a wide variety of job conditions.

Like yourself, Warren Brothers demand high performance from their machines in order to get the maximum return on equipment dollars. Proof of performance, proof that "on wheels it will pave for less" is that Warren Brothers own *ten* PF-90 pavers today. Get the full story for yourself. Call your Blaw-Knox Equipment Dealer today.

BLAW-KNOX

BLAW-KNOX COMPANY

Construction Equipment Division
40 Charleston Avenue, Mattoon, Illinois

For more facts, use Request Card at page 18 and circle No. 384

A revised catalog of Form-Crete all-steel prestressed concrete casting **forms.** Illustrated with photos of the line including double tee, single tee, inverted tee, bridge beams, I-beams, pilings, channels, and custom forms. Also illustrated are a number of interesting applications of prestressed concrete. Complete specifications for each form.

Write to the Food Machinery & Chemical Corp., Florida Div., Dept. C&E, P. O. Box 1718, Lakeland, Fla., or use the Request Card at page 18. Circle No. 100.

A folder describing Hopkins Volcanic **hot oil heaters** and emphasizing their use as economic producers of steam for curing beams, piles, and other prestressed units. Includes specifications for six models of heaters and four models of steam generators for use in the prestressed concrete field.

Write to Hopkins Volcanic Specialties, Inc., Dept. C&E, Alliance, Ohio, or use the Request Card at page 18. Circle No. 149.

Facts about Pozzolith water-reducing, air-entraining **admixture for concrete** and the advantages said to result from its use in prestressed concrete units. Illustrations, charts, and tables show such advantages as increased strength, bond, and durability, and reduced shrinkage and permeability.

Write to The Master Builders Co., Dept. C&E, 7016 Euclid Ave., Cleveland, Ohio, or use the Request Card at page 18. Circle No. 148.

Literature on the new T. L. Smith **turbine-type concrete mixer.** With its ability to provide extra-high-strength concrete, the unit is said to be of special advantage in prestressed operations. According to the literature, the mixer also makes possible a substantial saving in time and material.

Write to the T. L. Smith Co., Dept. C&E, 2835 N. 32nd St., Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 165.

A folder describing and illustrating four typical jobs using Stressteel **post-tensioning tendons.** Both photographs and diagrams of the stressing patterns are included. Information about types of Stressteel bars and wedge anchorages is given.

Write to Stressteel Corp., Dept. C&E, 221 Conyngham Ave., Wilkes-Barre, Pa., or use the Request Card at page 18. Circle No. 154.

A generously illustrated booklet showing numerous installations of Raymond prestressed **concrete piles** and detailing designs. Diagrams, specification tables, and other pertinent information on these prestressed cylinder piles.

Write to Raymond Concrete Pile Co., Dept. C&E, 140 Cedar St., New York 6, N. Y., or use the Request Card at page 18. Circle No. 150.

A descriptive sheet on U. S. Construction Products' lightweight **steel girder forms** for prestressed or poststressed concrete. Features the flexibility of the forms, which are available in adjustable lengths from 30 to 100 feet. Illustrated with dimensional drawings.

Write to the U. S. Construction Products Co., Dept. C&E, 2242 N. 35th St., Milwaukee 8, Wis., or use the Request Card at page 18. Circle No. 139.

Fact sheets designed for contractors who want to go into **production of prestressed concrete units.** Illustrated descriptions of problems encountered on various jobs, and how solved through use of Elgood equipment. Specifications for jacking systems, pumping units, etc.

Write to the Elgood Hydraulics Corp., Dept. C&E, 372–80 Ten Eyck St., Brooklyn 6, N. Y., or use the Request Card at page 18. Circle No. 132.

Literature describing the full line of Freyssinet-engineered material and **equipment for prestressing.** Includes anchorage units, cable assemblies, tensioning jacks, hydraulic pump, grout mixer, and grout pump.

Write to the Intercontinental Equipment Co., Prestressed Concrete Div., Dept. C&E, 120 Broadway, New York 5, N. Y., or use the Request Card that is bound in at page 18. Circle No. 177.

Literature describing the Economy steel **form rental service.** Includes such features as estimates of form labor and material, form erection drawings for field and office use, trained men for contractor to employ, and many others.

Write to the Economy Forms Corp., Dept. C&E, P. O. Box 128, HP Station, Des Moines, Iowa, or use the Request Card at page 18. Circle No. 178.

Literature on the Wyco Junior **concrete vibrator** for the prestressed concrete field. Stressed are the small-diameter vibrator heads—1, $1\frac{1}{4}$, and $1\frac{3}{8}$ inches—for close work between stressing cables, as well as the unit's ability to handle low slump concrete. Illustrated with photographs.

Write to Wyzenbeek & Staff, Inc., Dept. C&E, 223 N. California Ave., Chicago 12, Ill., or use the Request Card at page 18. Circle No. 161.

A catalog describing Rodgers **hydraulic prestress power units** for prestress beds operated with either one, two, or four jacks. Also includes information on double-acting jacks and pump accessories, a conversion chart for jack pressures, and specifications. Illustrated with on-the-job photographs.

Write to Rodgers Hydraulic, Inc.,

For more facts, use coupon or circle No. 385→

Teer's CAT* No. 12s help build approach to Patapsco River Tunnel

An important new highway link for North-South travel is the Patapsco River Tunnel, south of Baltimore, Md. It will create a direct connection between Rt. 40 and U. S. 1 without bucking mid-city traffic.

Nello L. Teer Co. of Durham, N. C., is building a 2½-mile section of the four-lane divided expressway leading to the tunnel. The contract calls for moving 1,200,000 cubic yards of earth. Teer's spread on this job includes 12 Caterpillar DW20 Tractor-Scraper units, six D8s, a D9 and two Cat No. 12 Motor Graders.

Good haul roads contribute to low-cost earthmoving, and keeping roads in shape is a motor grader job. With its rugged construction, balanced design and dependable four-cycle Cat Diesel Engine, the No. 12 is built for top production around the clock. Positive-acting controls, easy blade positioning and excellent job visibility all help the operator do more work with less effort. The exclusive Caterpillar oil clutch operates smoothly many hundreds of hours without adjustment. Tubeless tires, at no extra cost, reduce tire down time. And in-cab starting, electric or gasoline, is standard.

Your Caterpillar Dealer not only sells these top-performance machines but takes a personal interest in protecting their long work life with reliable parts and service. See him today.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

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WANTED— THE HARD WORK

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Here in one booklet is *all* the latest information on the new highway program. Find out how, where and when the money will be spent; standards for the new freeways; final routes of the Interstate System. Everything you need to know to share in the greatest construction job in history.

Dept. C&E-9, Caterpillar Tractor Co.
Peoria, Ill.

Please send me immediately ..... copies of "The Road Ahead."

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Company.....

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City..... State.....

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-ALL IN ONE OPERATION

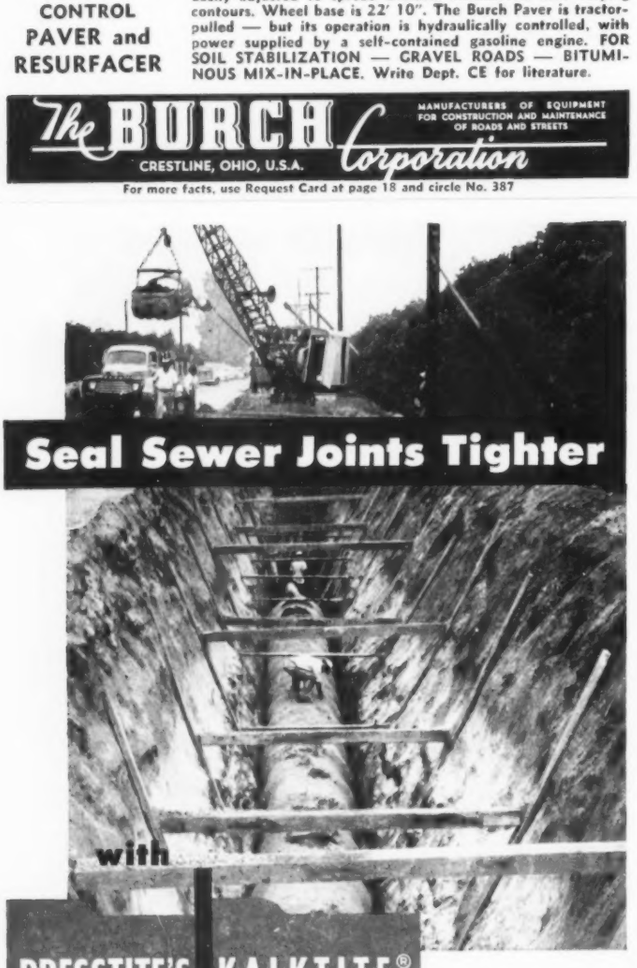
BURCH THE MODEL 12 ONE-MAN CONTROL PAVER and RESURFACER

Mixes, spreads, and levels bituminous material 10 to 12 feet wide in ONE pass. Material is rolled and mixed FOUR times. Easily adjusted to spread uniform thicknesses over varying contours. Wheel base is 22' 10". The Burch Paver is tractor-pulled — but its operation is hydraulically controlled, with power supplied by a self-contained gasoline engine. FOR SOIL STABILIZATION — GRAVEL ROADS — BITUMINOUS MIX-IN-PLACE. Write Dept. CE for literature.

The BURCH Corporation
MANUFACTURERS OF EQUIPMENT FOR CONSTRUCTION AND MAINTENANCE OF ROADS AND STREETS
CRESTLINE, OHIO, U.S.A.

For more facts, use Request Card at page 18 and circle No. 387

Seal Sewer Joints Tighter



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...meets Federal Specification SS-S-168

Over the past 30 years, the Presstite Sealing System has been thoroughly service-proved by many leading engineers and contractors. They will assure you it's the easiest, most economical way to get strong, tight joints that eliminate practically all ground water infiltration.

PRESSTITE'S 3-STEP SEALING SYSTEM

PRIMER — Improves bond between pipe and sealing compound.

ROPAX® — Non-porous, adhesive packing. Compresses to form additional seal impervious to water.

KALKTITE® — Cold mixed and cold applied. Dense, flexible, asphaltic cement. Sets internally; unaffected by hot, cold, wet or dry conditions.

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A Division of AMERICAN-MARIETTA COMPANY
3788 CHOUTEAU AVENUE, ST. LOUIS 10, MISSOURI

For more facts, use Request Card at page 18 and circle No. 388

Product Literature

Dept. C&E, 7415 Walker St., St. Louis Park, Minneapolis 26, Minn., or use the Request Card at page 18. Circle No. 138.

Literature on Superior **anchors for restraining wires and cables** in prestressed beams and girders, and on inserts for lifting prestressed and precast concrete members. Drawings detail the use of these prestressed concrete accessories.

Write to Superior Concrete Accessories, Inc., Dept. C&E, 9301 King St., Franklin Park, Ill., or use the Request Card at page 18. Circle No. 146.

A catalog describing the Cleveland line of electric **rotary vibrators** recommended for use in precast and prestressed concrete work. Four models are described, and complete specifications are given. Installations are diagrammed.

Write to The Cleveland Vibrator Co., Dept. C&E, 2828 Clinton Ave., W., Cleveland 13, Ohio, or use the Request Card at page 18. Circle No. 153.

Literature on the Prescon **prestressing system** which uses cold-formed heads to provide positive end anchorage for high-carbon, steel-wire stressing tendons. The system is said to replace older methods which provide anchorage by means of friction grips or threaded bars.

Write to The Prescon Corp., Dept C&E, Box 4071, Corpus Christi, Texas or use the Request Card at page 18 Circle No. 176.

Concrete floor protection — a folder describing the application and advantages of SonNoMar, a fast-drying liquid protective coating for concrete floors. Contains a table listing 35 chemical substances, with a rating of SonNoMar's resistance to them. Also includes figures on coverage.

Write to L. Sonneborn Sons, Inc., Building Products Div., Dept. BB, Dept. C&E, 404 Fourth Ave., New York 16, N. Y., or use the Request Card at page 18. Circle No. 49.

Tractor-mounted rotary drill —a descriptive sheet on the Porta-drill Model 6TA, an integral unit rotary drill mounted on a Caterpillar D6 diesel tractor. Contains an on-the-job photograph of the unit, brief information on its adaptability, and complete specifications.

Write to The Winter-Weiss Co., Dept. C&E, 2201 Blake St., Denver 5, Colo., or use the Request Card at page 18. Circle No. 52.

Flexible couplings—a catalog including information on the new Diamond taper-brushed flexible coupling. Charts show horsepower ratings, dimensions, maximum rpm, and other engineering data necessary in the selection of the correct coupling.

Write to the Diamond Chain Co., Inc., Dept. 487, Dept. C&E, 402 Kentucky Ave., Indianapolis 7, Ind., or use the Request Card at page 18. Circle No. 75.

Welding applications—Hobart Arc Welding News contains photographs and articles describing welding operations all over the world. Both construction and maintenance, as well as some unusual applications, are described. Volume XIV, No. 2.

Write to Hobart Bros. Co., Dept. C&E, Hobart Square, Troy, Ohio, or use the Request Card at page 18. Circle No. 42.

Drilling equipment—a bulletin listing augers, heads, bits, and other accessory parts for the Salem line of McCarthy horizontal and vertical auger drills. The catalog supplements Bulletins 100, 101, 102, and 105. Illustrated with photographs and drawings. Price list included.

Write to The Salem Tool Co., Dept. C&E, 796 S. Ellsworth Ave., Salem, Ohio, or use the Request Card at page 18. Circle No. 106.

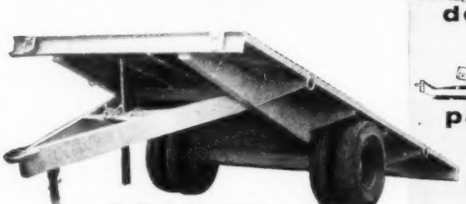
Scaffolding machines—a 16-page booklet describing the installation and operation of Gold Medal safety scaffolding machines. On-the-job photographs as well as drawings show how to install outrigger I-beams on bar joists, pan joists, republic arches, Q-decks, and other types of roof construction.

Write to The Patent Scaffolding Co., Dept. C&E, 38-21 12th St., Long Island City 1, N. Y., or use the Request Card at page 18. Circle No. 107.

Lift truck—a folder describing the engineering, design, and construction features of the Allis-Chalmers FT-100 lift truck. Specifications cover the 10,000-pound-capacity unit and the 230-cubic-inch Allis-Chalmers engines available in gasoline, LP gas, and diesel models.

Write to the Allis-Chalmers Mfg. Co., Dept. C&E, Milwaukee, Wis., or use the Request Card at page 18. Circle No. 120.

What do you haul?



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Any optional equipment extra
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MILLER *Tilt-Tops* take 'em all!

Whatever you haul . . . from 3 to 13 tons . . . there's a MILLER Tilt-Top to fit your equipment . . . load it, haul it, faster! easier! A variety of models equipped with single or tandem axles . . . over, or between-the-wheels platforms . . . put mobility under all sorts of equipment . . . save the extra loading time and extra cost of larger more cumbersome trailers. MILLER'S big oak decked platforms merge with the ground for the easiest kind of drive-on loading . . . save the bother of skids, cribbing or jacks. With a MILLER, ONE man can tilt, load, be on his way to the next job in less than TWO minutes . . . slash time between jobs. See this fast loading line of MILLER Tilt-Tops at your MILLER distributor today!

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Miller® Tilt-Top Trailer Inc.

For more facts, use Request Card at page 18 and circle No. 389

High-early-strength cement—detailed information, test reports, comparative-strength diagrams, and other engineering data on a new Belgian high-early-strength portland cement. Non-technical language describes the properties and suggested applications of C. B. R. III, said to set normally but harden very rapidly.

Write to the Indussa Corp., Dept. C&E, 511 Fifth Ave., New York 17, N. Y., or use the Request Card at page 18. Circle No. 182.

Masonry sawing—an abrasive and diamond sawing blade recommendation chart for building materials and refractories. The chart contains three separate recommendations for each type of material to be cut: general; faster cutting, less life; or slower cutting, longer life. A masonry blade conversion chart is also included.

Write to Concut Sales, Inc., Dept. C&E, 1845 Belcroft Ave., El Monte, Calif., or use the Request Card at page 18. Circle No. 108.

Air tool trouble chart—a bulletin explaining troubles encountered, causes, and remedies when using rock drills. A special trouble-shooting chart is included; pictures and drawings illustrate construction and maintenance details of various air tools.

Write to Le Roi Div., Westinghouse Air Brake Co., Dept. C&E, 3716 W. Wisconsin Ave., Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 46.

Rugged rigs—a folder of pictures showing Caterpillar tractors, dozers, pipelayers, and other machines in a variety of tough earthmoving applications. The booklet also lists component parts that contribute to the high efficiency claimed for these machines. Form No. D709.

Write to Caterpillar Tractor Co., Dept. C&E, Peoria, Ill., or use the Request Card at page 18. Circle No. 183.

Power pipe pushers—literature on Speed Thru power pipe pushers. Contains information on methods of installation, as well as brief specifications. Illustrated with sketches and photographs.

Write to Mercury Hydraulics, Inc., Dept. C&E, 2440 Blake St., Denver 5, Colo., or use the Request Card at page 18. Circle No. 159.

Motor graders—a booklet illustrating the versatility of Caterpillar motor graders. On-the-job photographs show the machine performing bank sloping, road construction, ditching, and other operations. Includes an outline of available attachments.

Write to the Caterpillar Tractor Co., Dept. C&E, Peoria, Ill., or use the Request Card at page 18. Circle No. 11.

Flexible plastic pipe—a booklet describing the Orangeburg SP Flexible plastic pipe. The literature includes information on fittings and installation, and specifications are furnished. Photographs, drawings, and dimensional tables.

Write to the Orangeburg Mfg. Co., Inc., Dept. C&E, Thomas St., Orangeburg, N. Y., or use the Request Card at page 18. Circle No. 118.

Apron feeders—a bulletin describing the newly re-designed Pioneer line of apron feeders. More than fifty types and sizes of unit feeders and two sizes of portable apron feeders are described. Contains general specifications, capacities, and horsepower requirements for the complete line. Illustrated with photographs.

Write to Pioneer Engineering Works, Inc., Dept. C&E, 3200 Como Ave. S.E., Minneapolis 14, Minn., or use the Request Card at page 18. Circle No. 77.

Combination ac-dc welders—a folder on the Idealarc 300, 400, and 500-amp combination ac and dc welders. Information includes a detailed description of the units' construction, and specifications are furnished. Illustrated with photographs.

Write to The Lincoln Electric Co., Dept. C&E, P. O. Box 3115, Cleveland, Ohio, or use the Request Card at page 18. Circle No. 47.

Power digger—a well-illustrated booklet on the Sherman Major, a heavy-duty backhoe unit designed for attachment to the Fordson Major tractor. On-the-job photographs and dimensional drawings show the machine's versatility. Close-up photos of major parts; specifications.

Write to Sherman Products, Inc., Dept. C&E, 3200 W. 14 Mile Road, Royal Oak, Mich., or use the Request Card at page 18. Circle No. 16.

Carbureted power units—a booklet describing the I-H increased horsepower line of 4-cylinder carbureted power units. The literature is illustrated with photographs, and an informative line graph, illustrating power and fuel-consumption curves, provides a useful ready reference for each unit.

Write to the Construction Equipment Div., International Harvester Co., Dept. C&E, 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18. Circle No. 54.

Trailers—a catalog describing the Smithco line of heavy equipment trailers. Portable office units, as well as utility tool and equipment trailers, are also discussed. Photographs, specifications, dimensional drawings.

Write to L. B. Smith, Inc., Dept. C&E, Camp Hill, Pa., or use the Request Card at page 18. Circle No. 21.

Paving tools—a catalog describing Cleveland Formgrader's complete line of floats, brooms, tampers, straight edges, lutes, scratch templates, and other equipment, as well as the Formgrader and Trailgrader. Testimonial letters, photographs, and specifications.

Write to Cleveland Formgrader Co., Dept. C&E, Mills Road, Avon, Ohio, or use the Request Card at page 18. Circle No. 39.

Steel panel construction—a bulletin covering four types of buildings featuring the Steelox panel method of construction. Text consists mainly of specifications of the types described, and is illustrated with photographs and drawings.

Write to Armco Drainage & Metal Products, Inc., Dept. C&E, 703 Curtis St., Middletown, Ohio, or use the Request Card at page 18. Circle No. 5.

GET 59% MORE LIGHT OUTPUT...
From Model 120 500 Watt
STURDILITE
FLOOD LAMP
• Steps up night-time production —
• Adds to SAFETY! . . .
• Especially Adapted for Operations Such as Open Pit Mining, Stripping, Dredging, Excavating, Crushing and Mix Plants, Logging, Road Building, Drilling, Quarrying, Etc.
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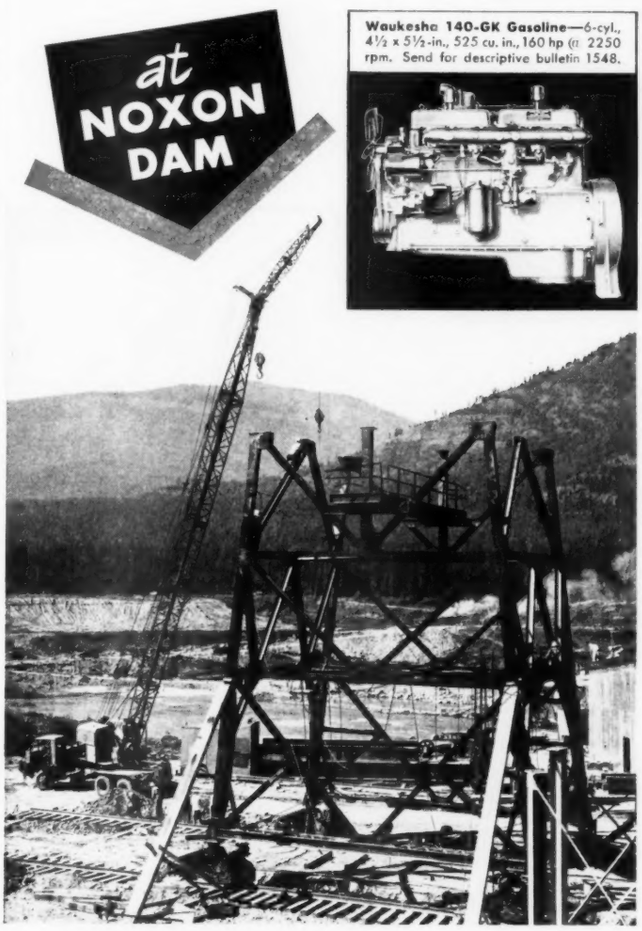
4727 N. 27th St. • Milwaukee 9, Wis.
Model 120-500 (500 Watt)
Model 120 (300 Watt)
EXCLUSIVE! Ventilated Housing Assures Longer Lamp Life

For more facts, use Request Card at page 18 and circle No. 390



Morrison-Knudsen own and use Lorain Crane

powered by

WAUKESHA

For the Noxon Rapids Hydroelectric Project on Clark Fork River in western Montana—Morrison-Knudsen Co., Inc. of Boise, Idaho are building a concrete and earth fill dam, maximum height 190 ft. and about 5930 ft. long. About the busiest piece of equipment on the job is their Waukesha-powered Lorain MC 505-W mobile crane. After setting up a concrete batch plant, it is shown here setting up a two whirley crane plant. The Lorain's 140-GK Waukesha Engine gives it safe, steady power with ready reserve for heavy handling as well as fast power for speedy mobility.

353

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN

NEW YORK TULSA LOS ANGELES

For more facts, use Request Card at page 18 and circle No. 391

Outdoor fork trucks—a brochure describing the Ranger line of fork trucks for outdoor handling. All three models in the line—of 7½, 10, and 15-ton capacity—are discussed. Schematic drawings and sketches illustrate the important components of the units. Tables and charts give full information on operating features and specifications.

Write to the Industrial Truck Div., Clark Equipment Co., Dept. C&E, Battle Creek, Mich., or use the Request Card at page 18. Circle No. 76.

Utility tractor—Booklet CR-1333-G, a folder describing the International 350 utility tractor. Contains close-up photos of the unit's important features, as well as on-the-job shots of the machine. Specifications and information on special equipment are included.

Write to Construction Equipment Div., International Harvester Co., Dept. C&E, 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18. Circle No. 116.

Hydraulic shock absorber—a folder describing the operation and advantages of the Greer Accumulator when used on front-end loaders. Both photographs and drawings point up the principle of the shock absorber and show how it can increase loader production. Installation is explained.

Write to Greer Hydraulics, Inc., Dept. C&E, New York International Airport, Jamaica 30, N. Y., or use the Request Card at page 18. Circle No. 43.

Oil filters—a booklet describing the advantages of Caterpillar oil-filtering elements. Drawings and photographs show the effects of varnishes, sludge, and abrasive particles on critical engine parts. The functions of detergent oils and their relation to filter elements are discussed, and cutaway views of these elements show components and diagram lubricating-oil flow.

Write to the Caterpillar Tractor Co., Dept. C&E, Peoria, Ill., or use the Request Card at page 18. Circle No. 50.

Wire—a 72-page catalog describing the complete line of CF&I-Wickwire. Contains diagrams, descriptions, and complete ordering specifications for low-carbon coarse wire, high-carbon fine and specialty wire, low-carbon fine and specialty wire, and flat and shaped wire.

Write to the Colorado Fuel & Iron Corp., Dept. C&E, 575 Madison Ave., New York, N. Y., or use the Request Card at page 18. Circle No. 63.

Grader blade control—literature describing the Preco automatic blade control unit for grading machines. Stressed is the unit's accuracy, said to be within ⅛-inch in 10 feet at faster travel speeds. On-the-job photographs show machines equipped with the device cutting 1½ to 1, 2, and 4 per cent slopes. Also includes close-up photos of the unit and design of its attachment; specifications.

Write to Preco, Inc., Dept. C&E, 6300 E. Slauson Ave., Los Angeles 22, Calif., or use the Request Card at page 18. Circle No. 113.

Cable reel trailers—a brochure describing the Ottawa line of multiple cable reel trailers. Three models are presented, with load capacities of 5,000, 7,500, and 10,000 pounds. Contains photos illustrating the units' safe, one-man operation. Specifications are furnished.

Write to Ottawa Steel Div., L. A. Young Spring & Wire Corp., Dept. C&E, 435 S. Main, Ottawa, Kans., or use the Request Card at page 18. Circle No. 48.

Lubricants—a 16-page illustrated catalog giving lubricant recommendations for nearly 4,000 service conditions for which lubricated plug valves can be used. Also shows lubricated plug valve accessories, fittings, automatic lubricators, and lubricant guns, and gives full information for choosing and ordering correct lubricants.

Write to the Homestead Valve Mfg. Co., Dept. C&E, P. O. Box 550, Coraopolis, Pa., or use the Request Card at page 18. Circle No. 64.

Air-entraining agent—a brochure discussing the properties, function, and advantages of Ayr-Trap air-entraining agent for concrete. Its application in paving, ready-mix concrete, concrete pipe, block, and other products is given. Instructions for its use included.

Write to A. C. Horn Co., Inc., subsidiary of Sun Chemical Corp., Dept. C&E, 10-10 44th Ave., Long Island City, N. Y., or use the Request Card at page 18. Circle No. 55.

Vibrating roller—a booklet describing the Essick Model VR-54-T vibrating roller. Lists features such as ability to compact higher lifts, and to the most rigid specifications, as well as its time-saving advantages in material-spreading and rolling. On-the-job photographs show the machine used in single, tandem, and triplex operations. General specifications.

Write to the Essick Mfg. Co., Dept. C&E, 1950 Santa Fe Ave., Los Angeles 21, Calif., or use the Request Card at page 18. Circle No. 162.

Ladder-type ditcher—a booklet describing the Gar Wood-Buckeye Model 403 utility ditcher. Action photographs show the ladder-type ditcher in a variety of job applications, and cutaway drawings detail the construction and operation of the machine. Complete specifications.

Write to Gar Wood Industries, Inc., Dept. C&E, 36253 Michigan Ave., Wayne, Mich., or use the Request Card at page 18. Circle No. 56.

Crushing and screening plants—literature describing the Series 44 and 45 portable crushing and screening plants with special scalping and sand-removal features. Nine different

Here's your answer to close bids and high costs:

Multiply your job range... Divide your rig investment by

Instead of sinking your capital in an old-fashioned "single-action" loader, let the same money buy four big-capacity International Drott 4-In-1 machine actions!

Instead of allowing profits to dwindle because an ordinary tractor-loader can't do 'dozer, scraper, or clamshell work, change to a 4-In-1! Move the machine-selector lever, right from the comfortable foam rubber seat, and watch your job-getting, profit-building potential go up and up!

You aren't getting just "another bucket"—but famous and exclusive Skid-Shovel® rock-busting, pry-action break-out. And 41° bucket-heaping, ground-level roll-back. It's the one and only true pry-action. That means full hydraulic power transfer—compact pry-lever length—and exclusive frame-mounted skid shoes to provide the vital fixed fulcrum!

And you're also getting easily-controlled, earth-rolling bulldozer action. Plus "carry-type scraper" action to grade, strip, or spread with inch-close accuracy. Plus super-speedy clamshell action, with bottom dumping to eliminate the sticky materials problem. Plus the exclusive performance protection of shock-swallowing Hydro-Spring!

Invest only 15 concrete-smashing, earth-rolling, load-gulping, sod-stripping minutes! Prove to yourself that an International Drott 4-In-1 multiplies your job range, and divides your investment, by four. Prove you can't afford to handicap your future with any limited-duty rig—when you can command the versatility unlimited. See your International Drott Distributor for a 4-In-1 demonstration.

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL® DROTT®

"Our International Drott 4-In-1 is a fine 'dozer—for stripping and pushing rock into the crusher hopper," reports Animas Valley Sand & Gravel Co., Durango, Colorado. "Besides, this machine is a better loader than those used before. And heavy lifting is easy with its clamshell."

Using 4-In-1 "carry-type scraper" action to fill ... bucket on the go—a special advantage in depth-controlled grad... or recovering and loading layered materials. "No limit to 4-In-... versatility of operation," reports Stehle Equipment, Inc., Annapo... Maryland—owner of the TD-14 4-In-1 shown.

screen arrangements are diagrammed, and a flow diagram and complete specifications are included. Form No. 661.

Write to Pioneer Engineering Works, Inc., Dept. C&E, 3200 Como Ave. S. E., Minneapolis 13, Minn., or use the Request Card at page 18. Circle No. 36.

Gear and socket wrenches—an illustrated catalog with complete information on how to order the Lowell reversible-ratchet gear and socket wrenches needed for specific jobs. Specifications and other details on industrial, strap, and hopper car wrenches, and on railroad car movers. A table simplifies figuring the correct-size wrench to fit any nut or bolt-diameter.

Write to Lowell Wrench Co., Dept. C&E, 54 Commercial St., Worcester 8, Mass., or use the Request Card at page 18. Circle No. 59.

Hard surfacing maintenance—a 20-page booklet treating wear and the need for overlays for abrasion, corrosion, friction, heat, and impact. Fifty-seven photos illustrate overlay applications and hard surfacing welding procedures. Other information includes a check list to help the welder determine which of 15 characteristics his overlay deposit should exhibit.

Write to Technical Information Service, Eutectic Welding Alloys Corp., Dept. C&E, 40-40 172nd St., Flushing 58, New York, N. Y., or use the Request Card at page 18. Circle No. 93.

Dryer burner units—a folder on Genco dryer burner units for rotary asphalt plant dryers. The literature discusses features contained in both single and multiple-burner units, such as high efficiency, long flame, positive ignition, dual fuel, automatic control, and push-button starting. Illustrated with photographs.

Write to the General Combustion Equipment Co., Dept. C&E, P. O. Box 387, Alliance, Ohio, or use the Request Card at page 18. Circle No. 58.

High-strength bolts—a how-to-do-it booklet detailing the installation of high-tensile bolts in structural frameworks for buildings, bridges, and other structures. Tables give bolt-tightening recommendations and washer sizes, also complete range of bolt sizes available from RB&W. Calibrating impact wrenches and correct use of air supply also discussed.

Write to Russell, Burdsall & Ward Bolt & Nut Co., Dept. C&E, 100 Midland Ave., Port Chester, N. Y., or use the Request Card at page 18. Circle No. 57.

Selecting an engineering firm—a brochure titled "A Guide for Selecting an Engineering Firm". Offers guideposts to help company officials determine whether to choose a firm that deals in consulting-engineering, construction-engineering, or design-engineering, and points out the specific differentiations of each.

Write to the Teller Co., Dept. C&E, 106½ N. McKean, Butler, Pa., or use the Request Card at page 18. Circle No. 62.

Roller chains and sprockets—a 68-page catalog describing and illustrating the Diamond line of stock roller chains and sprockets. Includes data on how to select a stock roller chain, how to establish the service horsepower required, and how to determine the size of driven sprocket. Catalog No. 757.

Write to Diamond Chain Co., Dept. 487, Dept. C&E, 402 Kentucky Ave., Indianapolis 7, Ind., or use the Request Card at page 18. Circle No. 44.

Bituminous application—a bituminous application guide designed to be a quick reference in determining the correct speed of a bituminous distributor when applying a predetermined amount of bituminous material to a road surface. Other information includes a chart on heat conversion; application and uses of various grades of tar, asphalt, and emulsion; and a guide for finding the correct truck speed.

Write to Littleford Bros., Inc., Dept. C&E, 453 E. Pearl St., Cincinnati 2, Ohio, or use the Request Card at page 18. Circle No. 51.

Sprocket replacement rims—literature includes instructions on how to install Kensington replacement rims for drive sprockets. The design of these rims is detailed, with advantages explained. A table lists rims available to fit various models of Caterpillar, Allis-Chalmers, and International tractors.

Write to Kensington Steel Co., Dept. C&E, 505 Kensington Ave., Chicago 28, Ill., or use the Request Card at page 18. Circle No. 41.

Slipform equipment—a well-illustrated booklet describing the Concretor slipform method of hydraulically raising concrete forms. Various types of structures and how slipform equipment may be used in their construction are discussed. Photographs show operation of the equipment and the finished structures.

Write to B. M. Heede, Inc., Dept. C&E, 30-01 37th Ave., Long Island City 1, N. Y., or use the Request Card at page 18. Circle No. 60.

Industrial tires—a 36-page illustrated guide book listing the complete line of B. F. Goodrich industrial tires. Also discusses the use of each type of industrial tire and the variations in pneumatic tire capacities at various speeds, as well as furnishing the latest available truck manufacturers' tire specifications.

Write to the B. F. Goodrich Tire Co., Dept. C&E, 500 S. Main St., Akron, Ohio, or use the Request Card at page 18. Circle No. 37.

←For more facts, circle No. 392

Doubling for dynamite, this 4-In-1 is digging and loading "unshot" sandstone material for binder and fill. Holland and Woodward Stone-Gravel Trucking Co., Decatur, Alabama, reports this material formerly had to be "shot"—before previously-used equipment could handle it!

One-gulp bucket fill of 4-In-1 as a clamshell permits picking up and loading, with ease, old tires, tree stumps, and similar "impossible" materials. Stockpile loading, too, is simplified with this "stand-and-fill" action. And the bottom-dumping clamshell gives a 2½-foot dumping height advantage over ordinary roll-forward buckets.

Equipped with Rock Fork instead of 4-In-1 bucket, this TD-14 is loading rock for rip-rap on a dam near Jacksonville, Texas. Bull-angledozer, wood-handling Skid-Grapples, Grubber Blade, and Bulldozer are other attachments that multiply International Drott usefulness!

Planning and production:

Scheduling

by GEORGE E. DEATHERAGE, P. E.
Construction Consultant

Planning and production are staff services devoted to serving the line departments—departments having direct authority. The planning and production staff usually has no authority over other departments or field operations. It is a service organization, designed to free the line officers and their organizations from details.

Basically, the department is divided into four subdivisions: the planning section; tool and equipment section; materials section; and the standards and methods section. When a job is not large enough to support all four subdivisions, the work of one or more may be allocated to other departments.

Planning department section

In the planning department is a scheduling section that deals with setting up and issuing job time schedules on the various work orders. It is responsible for keeping the jobs on schedule. The section has several other functions, most of them designed to keep work orders running on schedule. As a result, it centralizes a great mass of information and serves as an information bureau for the construction division.

The scheduling section is composed of a section head and checkup engineers, and the line of authority runs from the planning department head to the scheduling section head, to checkup engineers, to file clerk.

This section is concerned with the akeup of time schedules, job checkups, job data sheets, and the weekly progress report.

The time schedules establish a completion date on each work order and set up dates for the completion of the various steps of each job. Essentially, it is a table of the items on the work order, with a time element for installation marked for each item. With each item, such pertinent information as the date checked drawings are needed, the vendor, P. O. and shipping date are furnished.

Job checkups are allied to time schedules, which are issued weekly on each active job. These are reports divided into six main parts, presenting a complete status of the work order. A general summary suggests courses of action to the various departments of the construction organization so that work can be kept on schedule.

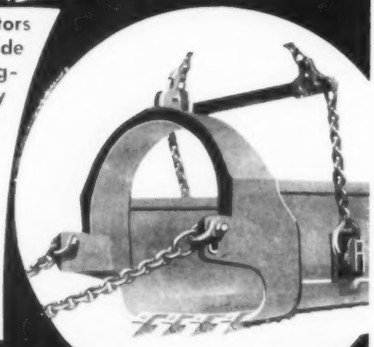
Job data sheets, set up for each order, supply the background of information used in making the weekly checkups. They also centralize data in the schedule section. The weekly progress report, covering the status of all work orders, is also compiled by the scheduling section.

This section also takes care of marking the date wanted on each bill of material, and this serves as a guide for the purchasing and expediting departments. In following up on purchase orders, it receives a daily expediting report from the purchasing department on any material due to be shipped or already shipped. The receiving reports are also routed through the scheduling section by the receiving department. The scheduling section enters the received date or any shipping information on these reports and enters them on the job sheets.

Each day the checkup engineers of this section make a personal investigation of field construction. This enables them to assist the purchasing department by letting it know when materials will actually be needed.

FOR 50 YEARS... Finest in the Field!

Contractors know and decide on Omaha Dragline Buckets for every use. They base their opinion on three important points:
• Lower First Cost
• Lower Operating Cost
• Lower Repair Cost
Strike pay dirt now! Complete information and specifications await your letter.



DRAKE-WILLIAMS MOUNT • OMAHA, NEBR.

OMAHA DRAGLINE BUCKETS

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When You Judge and Choose a Construction Magazine—
Consider All These Points Together . . .

1. CIRCULATION . . . For maximum value, a magazine must offer maximum coverage of the important groups that influence the purchase and preference for their advertisers' products and services.

Contractors do the buying and C & E delivers more contractors!

2. EDITORIAL . . . New job methods and procedures, new products and services, better management planning and scheduling—add not only reader interest in the magazine but create a confident, loyal following that adds tremendous value for those who seek a market.

C & E delivers more editorial and a higher ratio of editorial to advertising!

3. FORMAT . . . Size, and arrangement of both editorial and advertising layout, together with overall organization of contents must all be evaluated and analyzed when a magazine's worth, *as an advertising medium*, is being judged.

Only C & E helps the advertiser with reading matter above and beside every 7 x 10 ad and standard spread.

4. ADVERTISING . . . The number of *advertisers*, of *exclusive advertisers* and *amount of advertising*—these are important considerations.

More advertisers and more exclusive advertisers in C & E.

Contractors and Engineers
Magazine of Modern Construction
470 Fourth Ave., New York 16, N. Y.

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YES! YOU CAN BUY DIRECT
SEND US YOUR ORDERS FOR
NEW ROTARY SWEEPER
BROOM CORES
WE MANUFACTURE ALL SIZES

• Detroit-Harvester • Fordson • Grace (3 types) • Hough • Huber • Lull • Littleford • Little Giant • Meili-Brumbaug (3) • Rosco • Sweetswell And many others

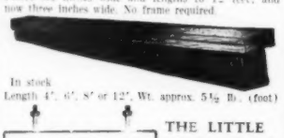
Also Cores Made to Your Specification

SUGGESTION To faraway users: Order cores only without any fibres but ready to fill.

Also furnished filled with Palmyra-Hickory or Brass Fibres or even Spring Steel Wires.

WE SHIP WORLDWIDE—IMMEDIATELY

Road Builders — it's sensational!
BIG PECKERWOOD BIG
C-O-N-T-I-N-U-O-U-S
Drag Broom Levelers with Spring Steel Wires or Brass Fibres six inches wide and lengths to 12 feet; and nine inches wide. No frame required.



In stock
Length 4', 6', 8' or 12'. Wt. approx. 5½ lbs. (foot)

THE LITTLE PECKERWOOD
3" wide, 15" long, with two bolts, fits your present frame.

KENNEDY'S
VAN BRUSH MFG. CO., INC.
Since 1928
Dept. A, 327 So. West Blvd., Kansas City, Mo.

For more facts, circle No. 395

This is the twenty-first of a series of articles on Construction Management by George E. Deatherage, P. E., construction consultant. The articles are based on an eight-volume "Manual of Advanced Construction Management" published by Geo. E. Deatherage & Son, P. O. Box 921, Lakeworth, Fla. The manual is used in a training course for superintendents and project managers, and is directed primarily at those contractor employees who have reached the foreman level or its equivalent, and who need practical help in order to take complete charge of construction projects themselves.

TIME SCHEDULE

DATE: 1/8/36
Sheet: 1 of 1

ISSUE NO. 2

ATOMIC CHEMICALS CORPORATION

CONSTRUCTION DEPARTMENT

WP-900 CATALYST MANUFACTURING PLANT - FORMER ELECTRIC FURNACE:

SCHEDULED COMPLETION DATE: MARCH 16, 1936

OFFICE SCHEDULE		UNIT				JOB SCHEDULE		
Ck'd Dwg. Req'd	P.O.& Vendor	Acct. No	Item No.	No. Pcs.	Description	Ship Date	Start Date	Comp Date
	1-30	26			Paint-Pipe & Equipment		3-9	3-12
Issd. 12-20	PC-44519 Al.Co.146	101	1101 1102	2	Reaction tubes 12"IDx6'-0" Alum. Tube with alum. cooling coil & air diffuser.		2-27	3-5
1-17	1-31 P. O. 674 Fairbanks Morse 12/18/103		1103	1	Structural Support		2-25	2-27
					Platform Scale: Recd. 500#. Cap. Portable Platform Scale	1-6	2-27	3-5
12-20	P.O.711	104	1104	6	Weighing Bottles		2-17	3-5

Figure 1

With the purchasing department files available, the scheduling section is able to keep the field personnel informed of all material receipts and shipments, and they can, in turn, prepare for the erection of incoming materials. The schedule section is also of service to the engineering drafting room, keeping it informed as to when drawings will be needed.

Job time schedules

The job time schedule prepared by the scheduling department concerns the erection of either buildings or equipment. The actual erection schedule determines the office schedule for drawings and purchases of materials. These schedules are prepared for all construction work orders in the scheduling department. After they have been approved, the schedules are issued to the office and field force.

The job time schedule is the basis of orderly planning. It is designed to show the correct sequence of operations for a given piece of construction. It estimates the length of time needed for the various phases of work and

(Continued on next page)

GOT THIS?
(Predraining Problem)

GET THIS!
(Skilled Wellpoint Engineering)

From

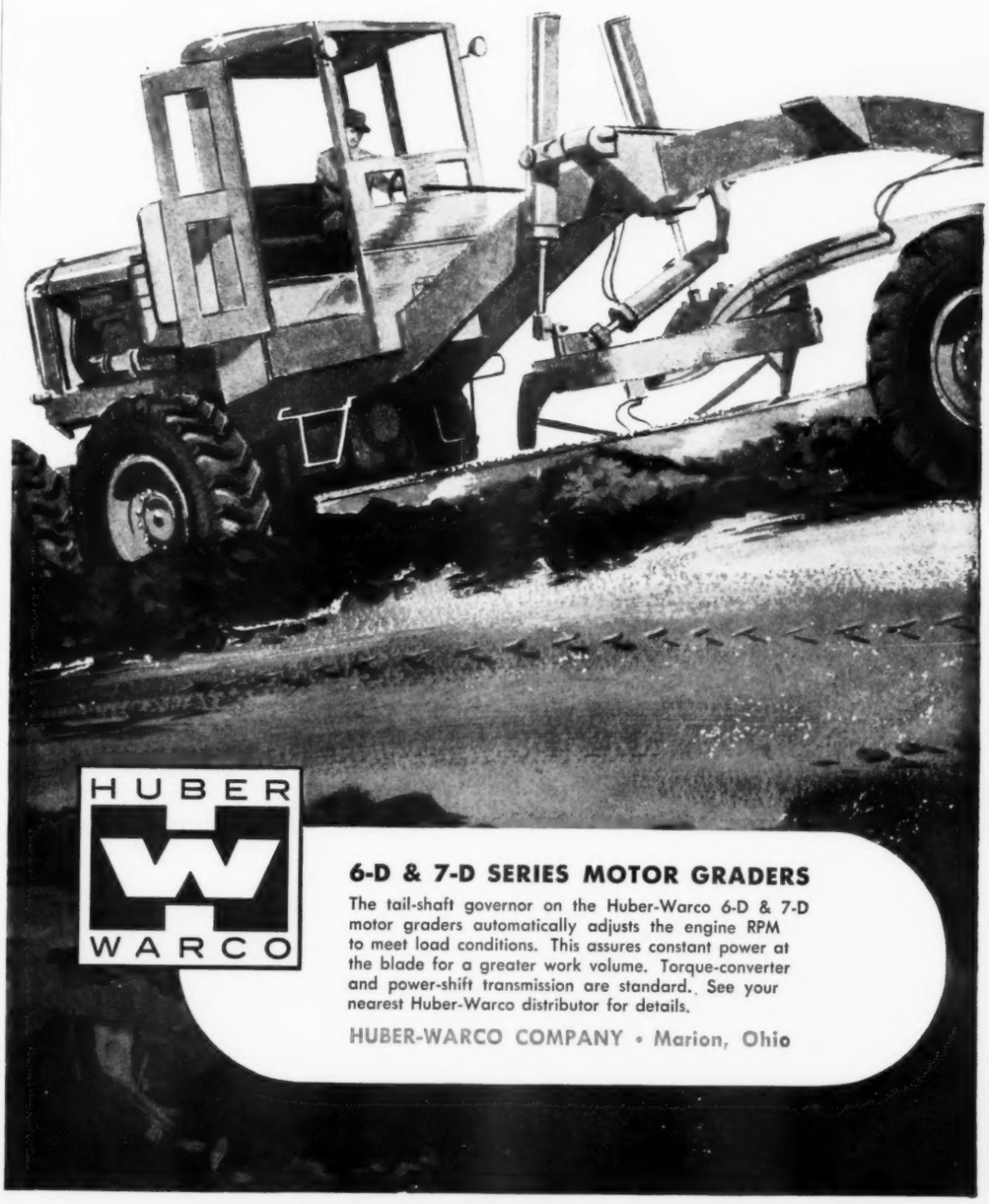
GRIFFIN

WELLPOINT CORP.
881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.

For more facts, circle No. 396

CONSTANT

BLADE POWER



HUBER WARCO

6-D & 7-D SERIES MOTOR GRADERS

The tail-shaft governor on the Huber-Warco 6-D & 7-D motor graders automatically adjusts the engine RPM to meet load conditions. This assures constant power at the blade for a greater work volume. Torque-converter and power-shift transmission are standard. See your nearest Huber-Warco distributor for details.

HUBER-WARCO COMPANY • Marion, Ohio

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(Continued from preceding page)

GRAPHIC SCHEDULE - SEQUENCE OF ERECTION

TP-666 - INSTALLATION OF FURNACE GAS COMPRESSOR

NO. 11 - COMPRESSOR BUILDING — May 21, 1950 Issue #1

Scheduled Completion Date: Aug. 28, 1950

Date	Scheduled Erection	Date	Scheduled Erection
June 6-9		7-11	Erec. Equip.
6-10		7-12	Item E-1 Surge Tank
6-11		7-13	E-5 Compressor
6-12	Final Pipe Sketches & Fills	7-24	E-7 "
6-13		7-25	E-15 Intercooler
6-14		7-26	E-8 "
6-15		7-27	E-6 Surge Tank
			E-10 Separator
6-16		7-28	
6-17		7-29	
6-19		7-30	Erect Piping & Instr. Elec. Lgt.
6-19		7-31	
6-20	Acct.40 Covers Aug.	8-1	Plant Shut down and tie-in
6-21	" 58 Trenches	8-2	
6-25	" 101 Foundations	8-3	
6-26	Structural Supports for Equip. & Piping	8-4	
6-26		8-5	
6-27		8-6	
		8-7	
		8-8	Insulate

sets actual calendar dates for the drafting room, purchasing department, and field construction forces. It is prepared as a guide and is not to be used as a hard and fast schedule.

The job completion date can be determined in a number of ways. On receipt of a new work order, the operating department is contacted and the job discussed with the department head for whom the work is to be done. He will either specify the completion date, or ask that the work be done as soon as possible. In the latter case, the completion date is left up to the head of the scheduling section.

Figure II

The completion date is determined after a skeleton schedule has been set up. This schedule takes into account the controlling factors on a job. This may involve the time required to prepare and get drawings of the proposed work, the time needed to get materials or equipment, or the time actually needed to construct the job.

Once the completion date is known, the job time schedule, as shown in Figure 1, is prepared. The heading is completely filled in with issue number, date, work order number, the full title of the work order, and the scheduled completion date. The accounts are listed numerically on the form—account number, item number, number of pieces and their description. Under the description of each account should be listed any supporting item such as foundations, insulation, structural supports, as noted on the job data sheets. When these have been filled in, the engineer scheduling the work order determines the number of days that should be allowed for each account, from either the planning department data file or from the field organization. These numbers are noted lightly in the right-hand margin, opposite the account description.

The controlling erection dates and scheduled completion dates are used as a basis in filling in the erection dates for the other accounts. Dates are assigned that will place the accounts in a logical construction sequence. The erection period covers the number of days specified in the right-hand margin.

The column "Check Dwg. Recd." is filled in by making reference to the erection dates and the length of time drawings must be issued to the field before erection can start. The purchase order number and vendor's name are entered into the proper column, and the vendor's promised delivery date in its respective column.

If an item has not been purchased, the column "Delv'r. Date" is first filled in to agree with the schedule erection dates, prefaced by the word "wanted". This date, and the length of delivery time obtained from the purchasing department makes it possible to determine when the purchase order should be placed for the item. This date is entered in the column "P.O. & Vendor", prefaced by the word "wanted".

The schedule is now complete and the completion date can be filled in at the bottom of the sheet. This schedule should be carefully studied for any unreasonable dates—dates that are impossible to meet or that will work hardships on any department—so that any adjustments can be made.

With a satisfactory schedule set up, the section can forward a note to the operation department for approval. This obtained, the original detailed job schedule is routed through the engineer of design and construction, and the superintendent of con-

RUGGED

CLARK EQUIPMENT · Ford · KW · IH INTERNATIONAL HARVESTER · HIGHWAY · HENDRICKSON · Mack TRUCKS · GarWood Buckeye · CUMMINS · White · M-R-S · EUCLID · Cleveland Crane & Carrier Corporation · T

Because MECHANICS Roller Bearing UNIVERSAL JOINTS drive through KEYS—instead of bolts—they stand up under punishment that shears off other types of fasteners. They are designed with less parts and connections for easy assembly and servicing — smooth running balance — maximum strength with less weight — and long, trouble-free, safe operation. Rugged stamina is just one of the advantages you get when you specify MECHANICS Roller Bearing UNIVERSAL JOINTS. Let MECHANICS engineers help you design this and other competitive sales features into your product's transmission train.

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For Cars • Trucks • Tractors • Farm Implements • Road Machinery • Aircraft • Tanks • Busses and Industrial Equipment

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Figure III

Geo. E. Deatherage & Son

LOCATION Baltimore
WORK Building
OWNER Sun Publishers

CONSTRUCTION PROGRESS REPORT

DATE 7/15/57
SIGNED G.E.D.
JOB NO 1801 REPORT NO 2

PROGRESS	DISCRIPTION OF WORK	ESTIMATED AND ACTUAL TIME SCHEDULE		
		AUGUST	SEPTEMBER	OCTOBER
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%	Clear Site & Excavation			
	Concrete Foundations			
	Form Work			
	Reinforcing Steel			
	Brick Masonry			
	PROGRESS OF ENTIRE JOB			

RED LINES INDICATE PERCENTAGE OF WORK COMPLETED

ESTIMATED TIME SCHEDULE SHOWN WHITE ON UPPER LIGHT LINE
ACTUAL " " " YELLOW " LOWER " "
VERTICAL RED LINE SHOWS CONTRACT DATE OF COMPLETION

struction, for their initials. This copy is kept by the planning department as its authority for issuing the schedule. The schedule is then typed, duplicated, and distributed according to a standard mailing list.

Preliminary schedules

In many cases it is desirable to set up schedules before enough information is available to determine a workable schedule. Here, the regular routine is followed as far as possible, and the missing information estimated. These are not intended as workable schedules. As soon as enough information is available, the preliminary schedule should be superseded by a working schedule designated "Issue No. 1".

In some cases when it becomes impracticable to meet the schedule, a revision should be made. The same procedure should be used in rescheduling the job as in making up the original schedule. The revise should be titled "Issue No. 2", and a note placed at the bottom explaining the reason for the revision. The number of issues is not limited, but they should be kept at a minimum. A variation of a few days in meeting the schedule does not mean that a new schedule has to be prepared.

Types of schedules

There are two distinct types of schedules—the tabular form, shown in Figure 1, and the graphic schedule, shown in Figure 2. The latter are drawn up and issued with the standard tabular schedule, since they make it easier to visualize the main features of a job. On small or uncomplicated jobs, graphic schedules are not needed.

Another type of graphic time schedule, which might be used effectively on a simple building operation is shown in Figure 3. Here, the various subdivisions of the work are listed in the sequence usually followed in the field. The estimated time for any particular phase of the work is indicated on the upper line; the actual time is indicated by colored pencil on the lower lines. This form serves a double purpose as a time schedule and a progress report.

If the work is large enough, and more detail is required, a separate sheet may be made out for each of

(Continued on next page)

EVEREADY Makes the World's Fastest, High-Production, Self-Propelled CONCRETE SAW!

EVEREADY POWR-DRIVE CONCRETE SAW

Eveready features Hydra-Eze blade depth control for smooth accurate depth selection—Tri-Matic Blade Alignment assures True cutting on the most irregular surfaces. Interchangeable Blade Guard allows cutting on either side of the saw.

Model E-25 PD
Self-Propelled
—1 of 22 Fast Cutting Models To 36 H. P.

There's an Eveready Blade for All Concrete and Asphalt sawing jobs.

4 PLY REINFORCED

EVEREADY TUFFIE REINFORCED BLADES

EVEREADY READY-CUT DIAMOND BLADES

EVEREADY POWR-DRIVE GIVES YOU FASTEST—EASIEST CUTTING

You select and Control the cutting speed with POWR-DRIVE. Dawn to Dusk more concrete per hour can be cut with lower operating cost and less operator fatigue. Two abrasive coated wheels act as a friction drive from the two rear saw wheels. Handy foot lever engages or disengages self-propelling unit. Your Eveready Dealer has the new POWR-DRIVE Eveready Concrete Saws. See him TODAY!

• Cut with Tuffies at ⅓ the cost. New 4-Ply Tuffie Reinforced Abrasive Blades quickly cut Green Concrete which may contain mixtures of flint or gravel aggregate.

• Ready-Cut Diamond Blades on green or cured concrete or asphalt, cut faster, last longer, are more dependable job after job.

Your Local EVEREADY Dealer has a Complete Stock of Genuine EVEREADY SAWS, BLADES & PARTS CALL ON HIM!

EVEREADY DEALERS...
Around the World Are On Call To Serve You Better
Write for the Name of Your Nearest Dealer
EVEREADY BRIKSAW CO., 1104 UNION AVENUE, KANSAS CITY 1, MO.

B-337X

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Construction camera

This big cut dwarfs a Lorain 85 shovel with 2½-yard dipper as it loads out material to a rear-dump Euclid for the Manchester-to-Concord stretch of the New Hampshire thruway. Frank Palazzi & Sons, Johnston, R. I., work the rig against a 40-foot face; it digs and loads 4,300 yards daily.

Crushed limestone production of this Rogers Iron Works crusher averages 125 tons per hour at the Chandler Materials Co. quarry in Tulsa, Okla. Rock is fed to the pan feeder by a Dumptor. The Rogers 18×36 jaw crusher, powered by a Murphy diesel, feeds a 40×33 hammermill.

WISCONSIN

Heavy-Duty *Air-Cooled* **ENGINES**

...preferred construction power!

Long ago, the men guiding Wisconsin Motor Corporation laid down a fundamental policy . . . the reason today why Wisconsin Engines are preferred above all others, 3 to 56 hp.

The decision was made that if high torque design and heavy-duty features and construction could not be built into an engine of a specific horsepower . . . Wisconsin Motor Corporation would not build that particular engine.

That's why when you see an engine bearing the name "Wisconsin," you can be certain it is a heavy-duty engine . . . designed to deliver the work. You can be certain, too, that finest materials and features were used throughout . . . adding up to rugged performance on the job.

And your equipment is backed by a nearby service station. Write for bulletin S198, including handy service map, list of distributors, and service stations, plus data on all models.

Wisconsin-powered Rex Mixer, built by Chain Belt Co., Milwaukee, Wisconsin

WISCONSIN MOTOR CORPORATION, Milwaukee 46, Wis.
World's Largest Builders of Heavy-Duty Air-Cooled Engines

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(Continued from preceding page)

the subdivisions of work, which will be broken down into respective steps. Wrecking, excavation, and foundations, for instance, might be followed by such subaccounts as removing trees, bulldozer clearing, removing stumps, wrecking old buildings to grade, and others.

Similar graphic schedules can be prepared to suit work of any type and classification—on airports, bridges, or roads, for instance. If work is being done on roads, the station numbers can be filled in at the bottom of the sheet in the space allotted to "Progress of Entire Job". The schedule will show the progress of the work by stations, along with the time schedule.

If the job is large, this type of schedule may be made on plywood or composition board, and be made large enough so that it can be fastened to a wall. In this way, the schedule can be read directly by supervisors sitting in conference.

If the construction organization is to prepare working drawings and details of the work, it is obvious that a similar type of schedule can be made covering this phase of activity. In practice, the drawing process record is filled out with a complete list of all the drawings and details expected to be made, and the graphic schedule serves as a guide to operations in general. A few blank spaces are left under each subdivision for the listing of contingent drawings.

On the drawing process record is posted the date the drawing is expected to be completed. This date should meet the requirements for different phases of work indicated in the graphic schedules. If the drawing is for structural steel, it should be completed early enough so that bids can be taken, and work let, fabricated, and delivered. Ordinarily it takes from 7 to 14 days to get bids and proposals, and from 4 to 10 days for decisions to be made on proposals from the engineering department. An additional 3 to 7 days are needed to secure contract drawings. Altogether, it takes from 2 to 4 weeks to get a fabricated job in the shop.

A drawing process record can be "estimated", with all starting and finishing dates for drawing, checking, and approval set up in advance. The name of the person who is to make the drawing is omitted from this record. When the working record is made, the names of the men doing the drawings, and an actual time record of the drawings, are posted. This posted information makes it possible to calculate the man hours needed for each drawing or detail.

Drawing work sheets can then be prepared for the use of squad leaders in allocating the work to the men on the board and in keeping an account of the actual time that is spent on drawings.

The chief draftsman, reviewing the work sheets weekly, can keep a master process record up to date at all times. If any part of the work falls behind schedule, he is aware of it immediately and can take steps to speed the job. It is also possible to make an analysis of the work sheets to find the cost of making any particular drawing.

(Next month's article will deal with "Planning and production—scheduling and controls".)

ALL-NEW Heater-Planer ENDS DANGER OF FIRE!

ONE OPERATOR in one operation heats, softens, planes and conditions, asphalt streets, highways and airport runways. Leaves raw, clean, smooth surface, like newly-laid — in perfect condition for seal-coating and/or resurfacing. Does this job with a thoroughness and economy never before found in any road-maintaining machine or combination of machines. *In actual cases, costs have run as low as .10 per yard!*

U. S. Patent No. 2,705,906. Other patents pending.

For complete information and cost operating data, ask your dealer or write:

MONATCO MFG. CORPORATION
1401 Woodland Kansas City, Missouri

Dealership available in a few areas

Completely re-designed from the ground up

NEW MONATCO MODEL M-2

Offers for the First Time:

- Main drive engine over front axle, out of heat zone.
- Operator, fuel tanks, aux. engine in rear of heat zone.
- Two fuel cut-offs for extra safety.
- All parts in heat zone subject to heat damage water-cooled.
- Open frame with grill — heat rises straight up from heater hood.
- Maximum visibility of hood and blades from operator's position.
- Standard automotive parts throughout—this is NOT a farm implement.
- More power—15 forward speeds, 8 ft./min. to 25 MPH.
- Extra fuel capacity, 280 gal. Enough for 10 hrs. heaviest planing.

PLUS these other MONATCO features for efficient, low-cost operation:

- Patented MONATCO burner and heater hood provide UNIFORM temperature of 2000° or more.
- No incineration of asphalt with reducing flame and strict control over primary and secondary air. NO SMOKE.
- Separate motor powers fuel and air pumps, independent of speed machine is moving.
- Two hydraulic systems, for steering and for raising hood and blades.

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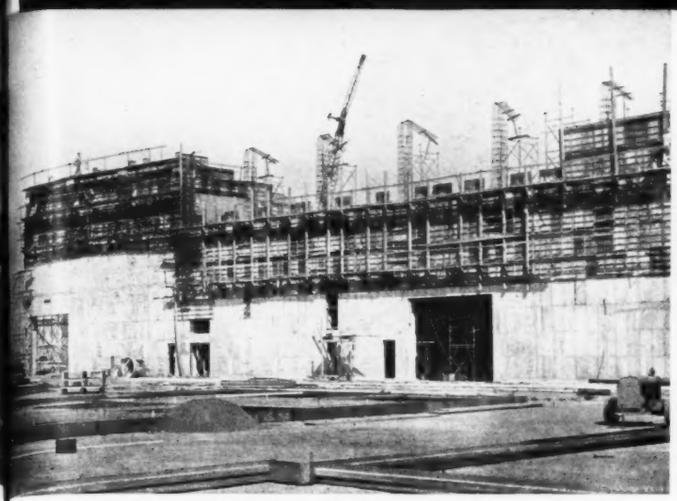


A big forming job is that on one of the largest aircraft maintenance hangars at Metropolitan Oakland International Airport, Oakland, Calif. Uni-Form prefabricated panels are being used for pours on the 45 to 60-foot-high walls of the 225×600-foot structure.

A million yards of excavation and fill are required for the Newton Creek Development project in Brooklyn, N. Y., an industrial area that will cover a 32-acre tract. Fill material being brought in is spread here by an International TD-18 crawler tractor. Some 22 structures were leveled for the new development.

Goodyear forms Guatemala subsidiary

The Goodyear Tire & Rubber Co., Akron, Ohio, has formed a new subsidiary corporation for the purpose of establishing and developing a rubber plantation in Guatemala. The subsidiary, Goodyear Rubber Plantations, Inc., has acquired 3,400 acres in the southwest section of the country for planting hevea trees. The new plantation will be under the supervision of W. E. Klippert, who is the manager of all Goodyear rubber plantations.

To handle the overseas sales of Goodyear chemical products, a new chemical division has been established within the Goodyear International Corp. The new division will handle all matters relating to overseas sales of synthetic rubber, rubber chemicals, plastic raw materials, and coating raw materials. At the same time, two new departments have been created within the chemical division —home office and field sales. The field sales department is divided into three sales areas, covering Europe, the Far East and the Western Hemisphere.

Frank G. Hough Co. personnel appointments

Jules C. Laegeler has been named chief engineer of the Frank G. Hough Co., Libertyville, Ill. Laegeler has been manager of the firm's product improvement department. He joined the company in 1951 as an experimental engineer, was made senior project engineer in 1955, and departmental manager the following year.

T. G. Granryd has been appointed manager of the firm's product improvement department. A former senior engineer, Granryd was promoted to project engineer early this year.

A. Medlin heads newly created I-H department

Abel A. Medlin has been appointed supervisor of the newly created Used Equipment Merchandising Department, Construction Equipment Division of International Harvester Co., Melrose Park, Ill. Medlin has been with I-H for 16 years.

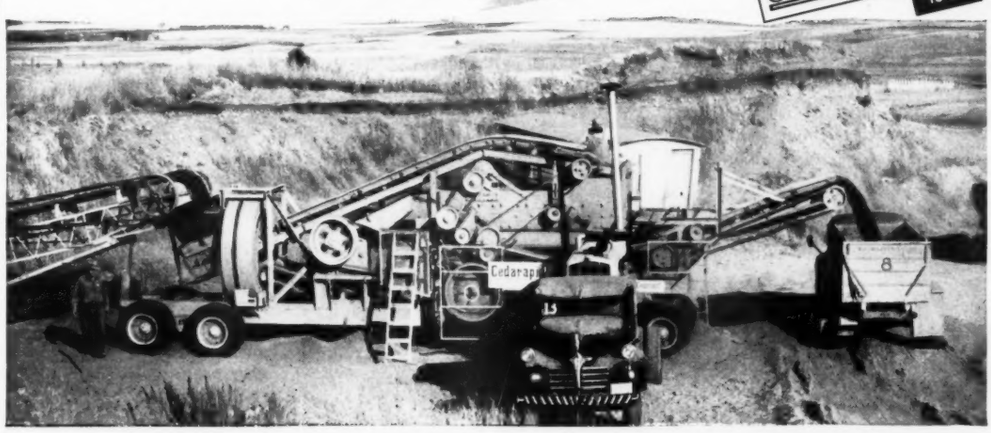
"324 tons per hour with 35% crush . . .

Wet and dry gravel crushed to 1" base material . . .

Maintenance costs estimated at 3/4¢ per ton . . .

Very little down time . . ."

Cedarapids Built by IOWA



No wonder Frank McLaughlin, President of F. J. McLaughlin Co., Marshall, Minn., is so well satisfied with his

CEDARAPIDS JUNIOR TANDEM

For some 14 years, Cedarapids Junior Tandems have always been hard plants to beat for high tonnage production. Newly re-designed last year, today's Junior Tandem adds a new kind of versatility to its profitable high capacity. With its bigger screen, and choice of jaw and roll crusher sizes which can be matched or mixed to give big primary capacity, big secondary capacity . . . or both . . . *the Junior Tandem is adaptable to the pit conditions you have to meet.*

Only a complete description of every Junior Tandem feature can show you how this plant will fit your profit picture. Ask your nearest Cedarapids distributor for details and production figures.

Apply these NEW JUNIOR TANDEM FEATURES to your job!

YOUR CHOICE OF CRUSHER SIZES
10" x 36" jaw crusher gives extra primary capacity when crushing percentages are high. 10" x 24" jaw crusher meets average conditions. 30" x 18" roll crusher assures production of high percentages of fine-crushed product. 24" x 16" roll crusher meets normal secondary crushing requirements.

BIGGER SCREEN
Width of the Horizontal Vibrating Screen has been increased 6" and a half deck has been added. The 42" x 10', 2½-deck screen produces from one to three products simultaneously, from 2" road ballast down to minus ¼".

"BIG PLANT" FEATURES AT SMALLER PLANT COST
Junior Tandems now available with sand ejector screw and washing spray bars (optional); monotype elevating wheel; delivery conveyor backstop; belt wipers; self-cleaning pulleys; new type adjustable eccentric on reciprocating feeder; larger hopper; separate clutch control on screen.

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U.S.A.

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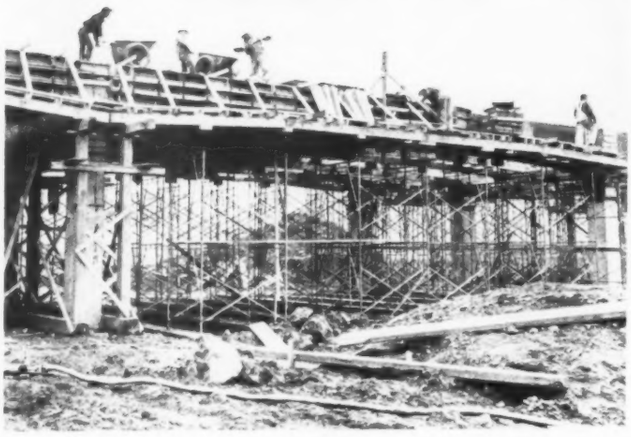
Construction camera



A hundred days off a 4,000-cubic-yard concrete-pouring job. That's the record of Lee Hoffman, Beaverton, Oreg., on this bridge over Myrtle Creek on U. S. 99 in Oregon. The firm used 3,144 feet of Symons panel forms for the 160,000-foot forming job. Pouring was completed in less than 220 days.

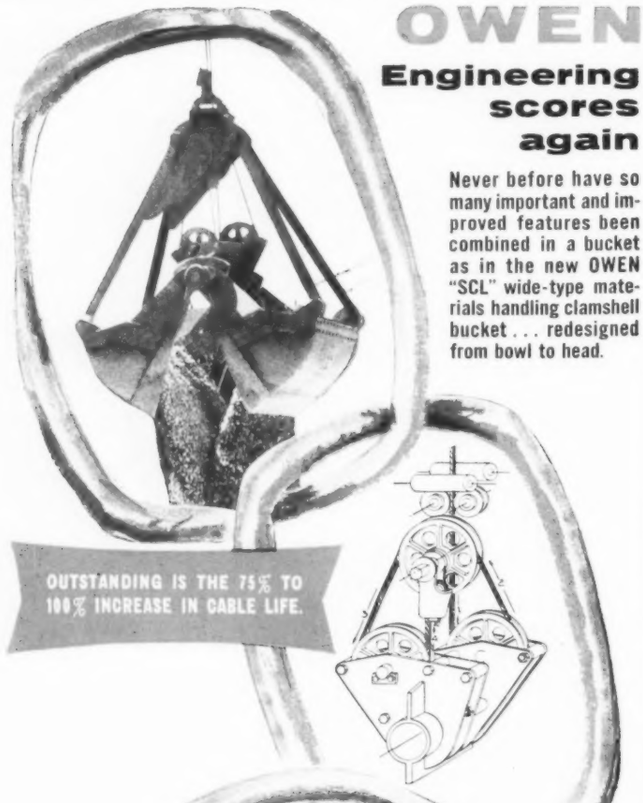
This Bucyrus-Erie 71-B dragline, out on a finger of land, works on the Long Sault Canal section of the St. Lawrence Seaway. The dragline, owned by Walsh, Perini, Morrison, Kiewit, and Utah Companies, loads truck with material from cut "F" near Massena, N. Y.

Workin
overhe
finishin
handle

OWEN

Engineering scores again

Never before have so many important and improved features been combined in a bucket as in the new OWEN "SCL" wide-type materials handling clamshell bucket . . . redesigned from bowl to head.



OUTSTANDING IS THE 75% TO 100% INCREASE IN CABLE LIFE.

Here's how it's done. The closing line now leads straight through the center plane of the head of the bucket to first lower sheave, thus eliminating bending of the closing line around upper guide sheaves as in conventional block and tackle and lever arm buckets.

Reinforced arms and crosshead afford greater durability without adding weight to bucket. Available in sizes ranging from 3/4 to 3 cubic yards inclusive.

Write today for additional information.

The OWEN BUCKET Co.
BREAKWATER AVENUE, CLEVELAND 2, OHIO
BRANCHES: New York • Philadelphia • Chicago
Berkeley, Calif. • Fort Lauderdale, Fla.

For more facts, use Request Card at page 18 and circle No. 403

American Photocopy names four regional managers

American Photocopy Equipment Co., New York, N. Y., has created a western sales division and appointed four regional managers. Three of the four managers will head newly created sales regions. Arnold B. Perry is the western sales manager. He will have jurisdiction over the Los Angeles, St. Louis, Chicago, Dallas, and San Francisco sales regions.

Jean H. Rockwell was appointed sales manager of the Los Angeles, Calif., region. His territory includes the states of Arizona, Colorado, New Mexico, southern California, and part of Nevada. Roger Rush has been named sales manager of the new San Francisco, Calif., area. He will cover Washington, Oregon, Utah, Montana, Idaho, northern California, and part of Nevada.

George Cibula is sales manager of the new St. Louis, Mo., area. He will serve Iowa, Missouri, Kansas, and parts of Nebraska, Illinois, Kentucky, and Tennessee. Robert McNaughton, sales manager of the new Detroit, Mich., area, will cover Michigan, Indiana, and portions of Ohio and Kentucky.

The firm also appointed Jack R. Le Veille district sales manager at Seattle, Wash.; and Martin Vignon, district sales manager at Miami, Fla.

C. E. Lyons has been appointed sales representative in the Jackson, Miss., area. From offices at 309 Millsaps Building, Lyons will cover Meridian, Vicksburg, Natchez, Greenville, Hattiesburg, and Laurel.

Heltzel Steel appoints

Ernest A. Gardner has been named director of engineering for the Heltzel Steel Form & Iron Co., Warren, Ohio, and its affiliated companies. Gardner was formerly the firm's sales manager for industrial sales.

He is a registered professional engineer in Ohio, and is a member of the Ohio, North Carolina, and National Societies of Professional Engineers.

New $2¼ Million Douglas Job Uses Ellis Methods

High-Speed Methods Applied to Suspended Reinforced Concrete Work

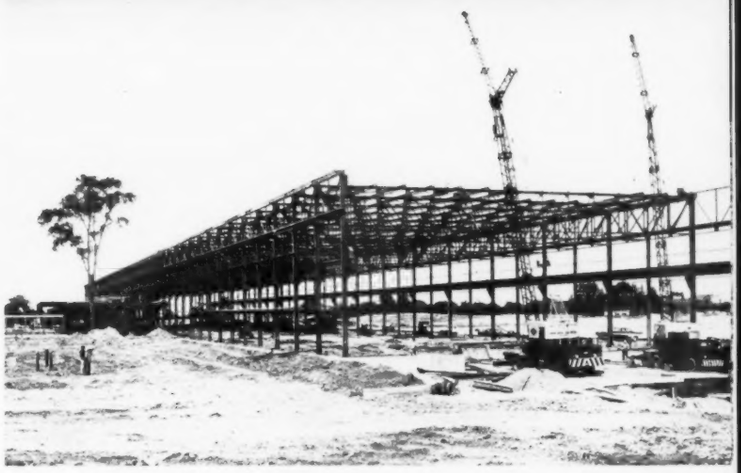
THE MARTIN K. EBY CONSTRUCTION COMPANY makes full use of today's most modern construction methods in building Douglas Aircraft Company's new Engineers Office Building in Tulsa, Oklahoma. Modern Ellis Methods simplify and speed up suspended reinforced concrete forming. This 2¼ million dollar project is reinforced flat concrete slab, drop panel, 180 x 385 feet, 3 stories high, with 156,000 sq. ft. of floor space. Supt. Bob Schenke employs about 10,000 Ellis Shore Clamps (part of which may be seen above on the visible rows of shores). After being used on one part of the job, they are moved for immediate re-use on another part. No lumber is wasted and great speed and adaptability are gained with utmost safety . . . thus big savings are possible with Ellis Methods.

• *From your plans, our engineers will work out complete suggested methods for top results.*

Ellis MFG. CO., INC. 211 N.W. 4th STREET OKLAHOMA CITY, OKLA.

For more facts, use Request Card at page 18 and circle No. 404

Working in a pair, P&H crawler cranes lift a crane girder into place for a 75-ton overhead crane on one of the four new buildings comprising the new cold strip finishing facilities of the Granite City Steel Co., Granite City, Ill. The job is being handled by Fruin-Colnon Contracting Co., St. Louis, Mo.



With an early 1958 opening scheduled, Frid Construction Co., Hamilton, Ontario, keeps work moving on the new copper mill for Calumet & Hecla of Canada, Ltd., at London, Ontario. Lima cranes team to place structural steel for the 822×104-foot main fabricating building in the $7,250,000 project.

Bil-Jax celebrates 10th anniversary

Bil-Jax, Inc., Archbold, Ohio, manufacturer of tubular steel scaffolding and related equipment, celebrated its 10th anniversary by moving into its new 2-story office building adjacent to the factory. The firm started in a 40×80 cement block building in 1947. Since then it has added to its floor space, until today its manufacturing and office facilities occupy 25,000 square feet.

Officers of the firm are William M. Wyse, chairman of the board; Wilbur M. Wyse, president and general manager; and Olen Britsch, secretary-treasurer.

Borg-Warner appoints

Tom Conway has been named director of manufacturing services of Borg-Warner Corp., Chicago, Ill. Conway was formerly general works manager of the Lycoming Division of Avco Corp.

FILOTECNICA SALMOIRAGHI INC.

. . . is pleased to announce that all the latest F S models of:

Optical Theodolites

Vial Levels

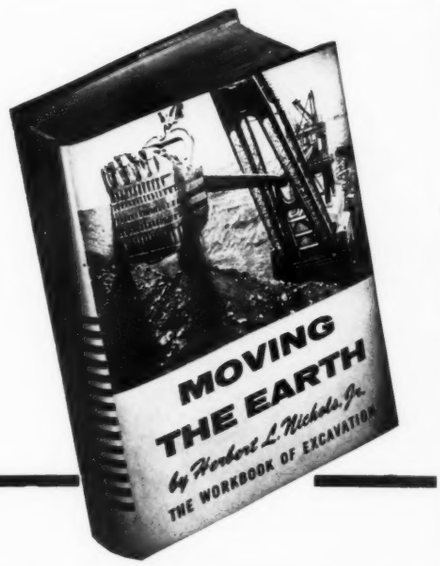
Self-leveling Levels

Planimeters

will be displayed at the following exhibitions:

- American Society of Photogrammetry
  October 2-4, 1957
  St. Louis, Mo.; Hotel Chase, Booth 22
- Texas Surveyors Association
  October 7-9, 1957
  Austin, Tex.; Hotel S. F. Austin, Booth 30/31
- American Society of Civil Engineers
  October 14-18, 1957
  New York City, Hotel Statler, Booth 11/12

For more facts, circle No. 405



The First Reference Book To Cover Every Aspect of Excavation and Earthmoving

Written by a contractor of twenty years' experience who is a recognized authority in this field. MOVING THE EARTH contains detailed descriptions of exactly what operations the excavating contractor must perform on literally hundreds of different jobs. You'll also find in it a wealth of information on the operation, maintenance, and repair of just about every machine used in excavating work.

MOVING THE EARTH contains 1,200 pages and 1,200 photos that can show you the way to lower costs through more efficient operating methods that will also produce better work. The enormous scope of this book—truly "A Workbook of Excavation"—is indicated by the 15-page table of contents listing hundreds of topics.

21 chapters are divided into 2 parts. Part One deals with the work—describing every operation from digging a cellar to grading a superhighway. Part Two describes every important type of excavating and earthmoving machine—how it is made and why, what it will do and how to run it, and—above all—how to take care of it.

You may obtain your copy, on approval, from:

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470 Fourth Ave., New York 16, N. Y.

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For more facts, circle No. 1

MOST PORTABLE PHONE for CONSTRUCTION WORK

needs only the VOICE for POWER

TALK UP TO 30 MILES. USI Sound Powered Telephones do a rugged job for busy construction outfits that are always on the move. Carry them with you wherever you need help to speed the job along.

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USI FEATURES BEST FOR CONSTRUCTION

- **Voice powered, need no batteries. Proof against power failures.**
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- **Headsets, handsets, pocketphones—up to 16-station systems.**
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- **Unchanging *Alnico* magnets have unlimited life.**
- **Bureau of Mines approved.**

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Please send more facts on how USI Sound Powered Telephones speed and simplify construction work.

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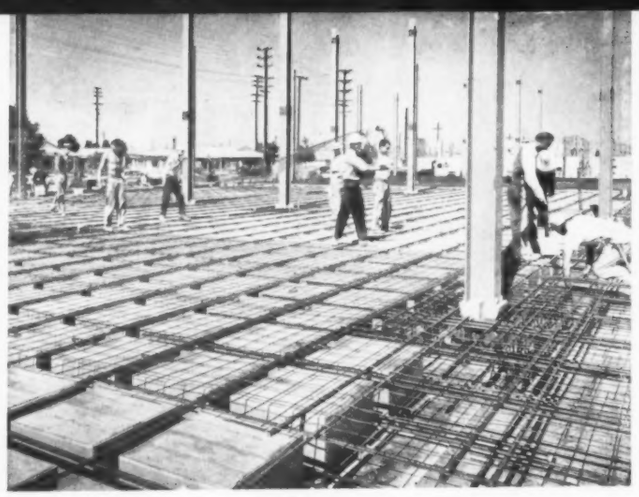
Construction camera



Getting ready for pours on the Lakewood High School in California, workmen install Bethlehem Pacific Steel reinforcing bars and wire mesh over special cardboard boxes. These will leave a "waffle iron" surface on the underside of the slab. About 275,000 square feet of lift-slab construction are going into the school.

Excavation for the new lift station at the Neptune Beach, Fla., sewage treatment plant is completed to a depth of 16.5 feet after 15 feet of water had been removed by a Griffin Wellpoint system. The job is being handled by William S. Smith Construction Co., Jacksonville.

It's not just a bit of metal you're buying...

it's

FEET OF HOLE!

That's why it pays to make sure it's a

CARSET JACKBIT

Let's face it — most carbide-insert rock bits look pretty much alike. But put a bit on a rod and drive it deep in solid rock and you'll find that they don't all behave in exactly the same manner. This all-important difference can be measured in only one way — and that's *feet of hole*. The bit that gives you maximum footage per dollar of bit cost is the one you want on your job.

Measure CARSET JACKBITS by this yardstick (those who know do) — on any drilling job — in any type of rock. Compare their long-term performance with any other bit you've ever used. We are confident that the results will speak for themselves.

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For more facts, use Request Card at page 18 and circle No. 408

Caterpillar appoints two new sales representatives

John E. Pilon has been appointed district representative in the Southwest Sales Division of the Caterpillar Tractor Co., Peoria, Ill. From headquarters in San Francisco, Calif., Pilon will serve dealers in Marysville, Sacramento, and Colusa, Calif.; Salt Lake City, Utah; and Reno, Nev. For the past six years he has been employed at the firm's Washington, D. C., office as priorities expediter, special representative, and as governmental sales representative.

At the same time, the company named Herbert J. Benzel earthmoving representative in the Plains Sales Division. He will serve dealers and customers in Montana, Wyoming, and North and South Dakota. Benzel was formerly field development engineer for Caterpillar.

Stone & Webster promotes Carter to special assistant

Robert J. Carter has been named a special assistant to the managing director of E. B. Badger & Sons Ltd. of London, England, a subsidiary of Stone & Webster Engineering Corp., Boston, Mass. Carter was previously district manager of Stone & Webster's office in Houston, Texas.

In 1949 and 1950, he was associated in the process and design engineering for the British Petroleum Chemicals project in Grangemouth, Scotland, a job covered by Stone & Webster. Carter is a member of the American Society of Mechanical Engineers, the National Society of Professional Engineers, and the American Petroleum Institute.

Highway Equipment news

H. V. Hiatt has been made assistant to the president, and R. H. Krimlofski has been promoted to assistant sales manager of the Highway Equipment Co., Inc., Cedar Rapids, Iowa. Hiatt has worked in production, tooling, engineering, finance, and management for other firms.

Truck speeds in Great Britain have been increased from a maximum 20 miles per hour to 30.

Anyone interested in building a secondary road with only two pieces of equipment can take a few pointers from R. L. Eatherly Construction Co., Nashville, Tenn. This Euclid TS-24 Twin-Power scraper, the first rig on the job, is preparing the way for final work by a motor grader.

Waste material from the site of a new Northern Pacific Railway bridge across the Clark Fork River near Noxon, Mont., is leveled in the dump area by two Caterpillar D8 tractors with bulldozers. The new bridge is made necessary by current work on the Noxon Rapids hydroelectric project.

Chain Belt acquires L. Burmeister Co.

The Chain Belt Co., Milwaukee, Wis., has acquired the L. Burmeister Co., Milwaukee. The acquisition is subject to the approval of the Federal Tax Department on certain tax matters of both firms. The Burmeister firm, which will complement Chain Belt's products in the ready-mix-concrete and roadbuilding industry, produces portable concrete batching plants, central mixing plants, and permanent concrete batching plants.

Burmeister will operate as a division of Chain Belt. Lloyd Burmeister will continue as president of his firm, and Walter E. Stuller will assume the newly created post of division manager.

Food Machinery division names sales engineer

Florida Division, Food Machinery & Chemical Corp., Lakeland, Fla., has appointed Ralph E. Davis sales engineer to cover the midwest. From headquarters in St. Louis, Mo., Davis will handle the Form-Crete prestressed concrete casting forms in Missouri, Iowa, Kansas, Nebraska, North and South Dakota, Minnesota, and the eastern counties of Colorado.

Kensington Steel names Bauhan sales engineer

Kensington Steel Co., Division of Poor & Co., Chicago, Ill., has appointed David K. Bauhan sales engineer in Maryland, Virginia, and North and South Carolina. Bauhan will assist Joseph F. Milmine in representing the firm in the southeastern coastal states.

Davey Compressor news

John J. Kloskoski has been appointed general service manager of Davey Compressor Co., Kent, Ohio. In his new post, Kloskoski will be in charge of parts and service for Davey portable and industrial compressors, truck-mounted compressors, rotary drills, air tools and accessories, and other Davey products.

Cannon Mountain Tramway Aerial Cables replaced after 18 years

carried 2,658,000 passengers

If you take a ride up New Hampshire's famous Cannon Mountain Tramway this year, you'll be supported by strong new cables built by American Steel & Wire Division of United States Steel.

The original installation was placed in operation in 1938 and it was not until 1956, after hauling 2,658,000 passengers, that the original American Steel & Wire Locked Coil Track Cables were retired. Temperatures ranged from 45 degrees below zero to 100 degrees above zero—and there was never a single wire failure or worry, according to Mr. William A. Norton, General Manager of the Tramway.

Operating during summer and winter, the Tramway provides the only means of transportation to the summit of the mountain for both vacationists and skiers. Riding in complete safety, comfort and protected from the weather in the glass-enclosed cars, the millions of riders have effortlessly enjoyed the panoramic views from this mile-long ride.

Each of the two special grade Locked Coil Cables are 5,765 feet long, 1⅞ inches diameter and weigh 28 tons. They were installed by a 12-man crew of the Interstate Equipment Division of the Yara Engineering Company of Elizabeth, New Jersey.

You choose the best when you buy "American Tiger Brand Wire Rope and Track Cable." Backed by research, engineering and manufacturing experience, you can expect superior wearing qualities, strength and resistance to fatigue.

AMERICAN STEEL & WIRE DIVISION
United States Steel, General Offices: Cleveland, Ohio
Columbia-Geneva Steel Division, San Francisco
Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors
United States Steel Export Company, New York

Cannon Mountain Tramway at Franconia, N. H. has two cars, each carrying 27 people at a climbing rate of 1,000 feet per minute. It takes about 5½ minutes to reach the summit. The cable is carried on three 90-foot steel towers and has a breaking strength of 201 tons.

Workmen helping to install the new American Steel & Wire cable at one of the 90-foot towers.

USS AMERICAN TIGER BRAND WIRE ROPE
Excellay Preformed

USS

UNITED STATES STEEL

For more facts, use Request Card at page 18 and circle No. 409

A well-dressed digging crew turns the first spades of earth to break ground for the new $3,250,000 engineering and research laboratory at the Harvey, Ill., works of Allis-Chalmers Mfg. Co., Milwaukee, Wis. Left to right are A. C. Boock, general manager of the Springfield works; E. J. Mercer, general manager of the Construction Machinery Division, Milwaukee; L. C. Daniels, general manager of the Buda Division; and F. A. Schick, chief engineer of the Engineering Department at the Springfield works.

Bethlehem Steel division plans engineering building

Pottstown Works, Fabricated Steel Construction Division, Bethlehem Steel Co., Pottstown, Pa., has completed plans for a new engineering office building. The building will house all drafting operations, administration, engineering, and billing functions.

When completed by the end of this year, the single-story U-shaped structure will be 150 feet across the front. Two 210-foot-deep wings will be occupied by the works' drafting department. The building covers 22,000 square feet.

I-H has used-equipment merchandising program

The Construction Equipment Division, International Harvester Co., Chicago, Ill., has a new plan for selling used equipment through its distributors. Called VM, value measured, it permits the I-H distributor to measure the value of each major component in a reconditioned or rebuilt machine. The value of these components is derived by estimating the condition of the part, if it is acceptable as is, or by listing the repairs and their cost on component tags which the distributor attaches to the machine.

After the VM used machine is put in the used-equipment lot, the prospective buyer has only to walk around the machine and check the condition or value of each component by reading the tags.

Yale & Towne appoints

James Rainey has been appointed district sales manager for the South Central United States by the Yale & Towne Mfg. Co., Philadelphia, Pa. From Chicago headquarters, Rainey will supervise the sale of the firm's industrial lift trucks and hoists in Missouri, Kentucky, Kansas, Oklahoma, Indiana, southern Illinois, Nebraska, and Iowa.

FASTER • DEEPER
MORE MANEUVERABLE
DIGGING EQUIPMENT
at less than half the cost
OF COMPARABLE MACHINERY

The Everett® Trencher MODEL 60

FOR FORD OR FERGUSON TRACTORS

- QUALITY BUILT THROUGHOUT
- FAST DIGGING ACTION
- ANY TYPE SOIL
- MANEUVERABLE RUBBER TIRED MOBILITY
- HYDRAULICALLY CONTROLLED CONVEYOR

Mobile Tractor Mounted . . . Digs clean, smooth trenches up to 5 ft. deep, as fast as 300 feet per hour.

Here's real trench sense . . . the answer to hundreds of building requests for a tractor-driven trencher that will do a big digging job at a sensible price. It's the compact, rugged, and versatile Everett Model 60 Trencher that operates from the power takeoff of the tractor — raised and lowered by built-in hydraulic system. It has the smooth operation of the wheel type trencher and the vertical advantages of the ladder type — digging close to buildings, curbings, pipes — ideal for pipeline inspection.

The Everett Trencher Model S Series
Equals the Work of 25 Pick and Shovel Men

Write today about another proven EEC Product for Industry

EARTH EQUIPMENT CORPORATION C&E
2036 Sacramento St., Los Angeles 21, Calif.
☐ Please send full information on new Model 60 Everett Trencher
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COMPANY_____
ADDRESS_____
CITY_____ ZONE____ STATE_____

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AC and DC ELECTRICITY FROM ONE GENERATOR

1200 WATTS, 110 VOLTS, ON THE HIGHWAY, IN THE FIELD, ON THE JOB, ANYWHERE A CAR, TRUCK, JEEP OR TRACTOR WILL GO

- Operates Cutting Tools, Saws, Drills, Routers, Planers, Sanders, Etc.
- Operates Flood and Search Lights, Warning Signals, Two-Way Radios and Telephones.
- Operates Water Heaters, Hot Plates, Coffee Pots, Shavers, Recorders.
- Operates Neon Advertising Signs on Mobile Equipment.

Dynamically and Statically Balanced. All New, Rugged Construction.

PLUS 6 or 12 VOLTS, 35 AMPS, DC, or up to 70 AMPS, DC, by simple application and little extra cost. Ask about it!

PLUG IN on Control Panel FLIP Switch and you have INSTANT POWER!

INSTALL IT IN PLACE OF PRESENT GENERATOR WITH SAME BRACKET

"DAC-VAC" Unit

NEW! REVOLUTIONARY! ECONOMICAL! SAVES TIME, MONEY and EVEN LIVES! Unlimited Applications for Industry, Construction, Agriculture, Forestry, Camping, Boating, Outdoor Life, far away from any power outlets.

AUTOMATIC ACCELERATION CONTROL of the COMBINATOR for accelerating engine to preset speed. "DAC-VAC" unit automatically changes current from DC to AC when AC tools are used.

Write for information and address of nearest dealer. Some territories still open for dealerships.

KURLAND MOTORS *Combinator Sales Division*
1134 BROADWAY — DENVER 3, COLORADO

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One Piece Fasteners that Really Stay Fast

Easy to apply . . .

ANCO SELF-LOCKING NUTS

Here's the self-locking, quickly installed nut that will stay locked even under the severest shock and vibration! Protect your product against these service conditions by specifying ANCO self-locking nuts . . . and add extra value at little cost.

Here's why: The locking pin and the nut form a single unit—the only one-piece standard nut with positive locking action . . . far more effective and practical than mutilated threads or squeezed nuts.

ANCO nuts can be furnished in black, cadmium or galvanized, aluminum, brass, bronze, stainless steel, etc.—full range of sizes from ¼" and up, in either coarse or fine threads to fit standard bolts.

Write for brochure with complete information

AUTOMATIC NUT CO. INC.
1500 WILLOW STREET
LEBANON, PENNA.

Canadian Representative:
W. R. Watkins Co., Ltd.
41 Kipling Ave. South
Toronto 18, Ont.

For more facts, circle No. 412

Production control board in use in Arizona termed "secret weapon"

A 4-foot-high and 7-foot-wide plastic and metal board with color-coded paper tabs and wooden pegs is one of the newest and more valuable tools being used by the Arizona State Highway Department.

Known technically as a Production Control Board, the device has been called the highway department's "secret weapon" in the job of building $43 million worth of roads during fiscal 1957–58.

Visually and concisely, the control board tells the story of each of the 50 construction projects now under way throughout the state. The projects are listed separately from the top to the bottom of the board by project number, location, type of construction, number of miles involved, and the commission district in which it is situated.

The board is divided into 10 sections longitudinally. These sections cover surveys, materials, computing, plans, bridges, estimates, right-of-way, Bureau of Public Roads, advertisement of the job, and remarks pertinent to the subject.

The paper taps are color coded—red standing for interstate, yellow for primary roads, blue for secondary roads. These tabs show the month when the work of a division is to be completed. Each section is subdivided into four quarters, showing when a division's work is 25, 50, 75, or 100 per cent complete.

The wooden pegs are also color coded. A green peg under any division denotes the percentage complete and on schedule of that division's work on a specific job. A red peg indicates the percentage of the job completed, but also shows the job to be behind schedule. A red peg in the "remarks" section denotes that special attention is needed on some phase of the work. A detailed explanation is then prepared and placed in a pocket file that describes the job.

After each division's work is complete, the tab is removed from that section. In this way, the job reaches the Bureau of Public Roads. After Bureau approval, the project is advertised for bids. When the job is awarded, it is removed from the boards.

Bendix Radio appoints

Luther H. Hoopes has been named advertising manager for the Bendix Radio Division, Bendix Aviation Corp., Baltimore, Md. In his new position, Hoopes will direct all advertising, publicity, and sales promotion of the Bendix line of two-way radios.

Sherman Products appoints

Marvin G. Maudlin has been named assistant advertising and sales promotion manager for Sherman Products, Inc., Royal Oak, Mich. Maudlin was formerly with Burroughs Corp. as assistant to the export advertising manager.

Pioneer Rubber names Allen representative

Charles M. Allen has been appointed southeastern representative of the Industrial Products Division, Pioneer Rubber Co., Willard, Ohio. Allen will cover Alabama, Georgia, Florida, North and South Carolina, Tennessee, Virginia, and part of Kentucky.

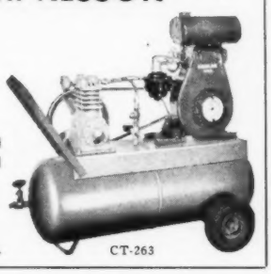
Koehring names two

Arthur V. Cossens has been named assistant sales manager for the Koehring Division, Koehring Co., Milwaukee, Wis. Cossens, previously field service manager, is succeeded in his former post by George E. Schmidt.

Use the Request Card at page 18 to obtain any of the literature described in this section.

Maintain Equipment at LESS COST . . . with the DECKER COMPRESSOR

★ Keep tires well aired
★ Pressure grease machinery
★ Spray paint Equipment
★ General shop use



Available gasoline engine or electric motor all sizes portable and stationary—to fit every need

Write for catalog

DECKER MANUFACTURING CO.
Dept. A · Box 1572 · Rockford, Ill.

CT-263

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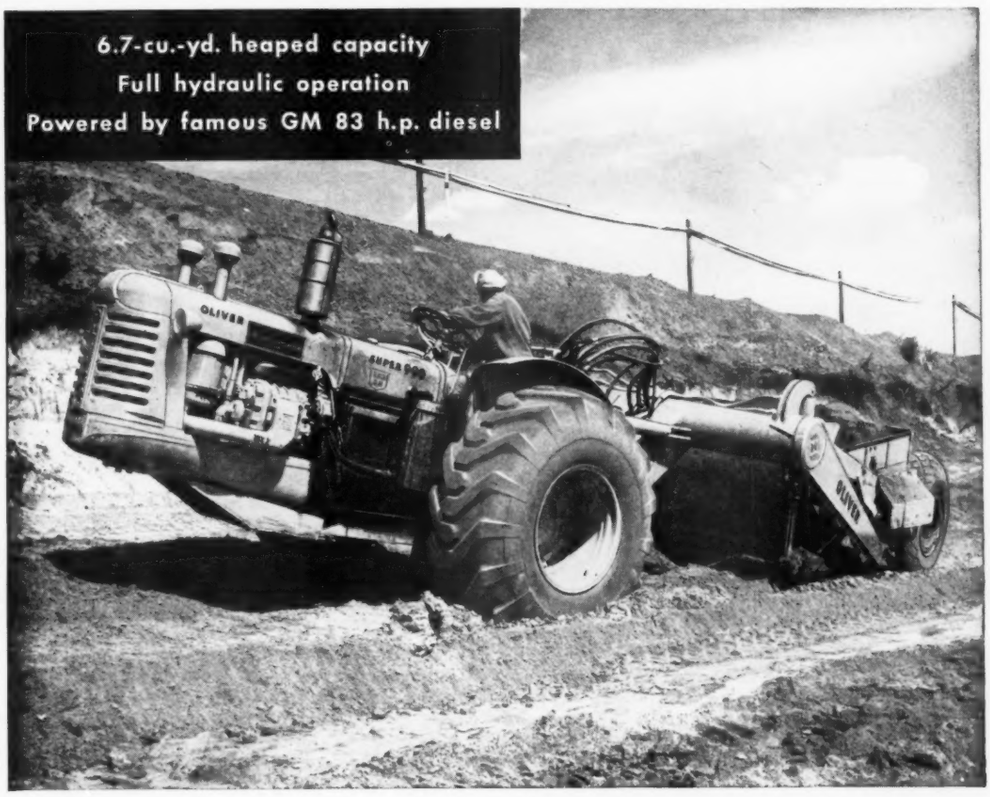

OLIVER 990 SCRAPER

cuts costs on any size dirt job

Priced thousands below others
You'll make no mistake with this new Oliver 990! With its small 6.7-cu.-yd. capacity you're set to work *everywhere* at low cost. And you'll be amazed with its ability.

Here's every operating advantage you want—fast cycle, full-biting scraper action, positive forward ejection, high clearance, 100% hydraulic operation. It's a ripsnorting, hard-working rig without expensive frills to run up your costs. The easiest self-loader on the market to buy.

New economy for small jobs
Now you can use the efficient scraper method on dozens of small jobs...outproduce other types of equipment on all kinds of grading, filling and spreading assignments ...and move quickly from job to job with its perfect road size. No permits needed.

A fill-in rig for big projects
You'll handle cleanup work on mass-fill jobs more easily, too. No need to divert larger machines. The 990 gets in more handily with its smaller size, maneuvers fast, makes complete nonstop 180° turn in only 33½'.

Bulletin I-703 has detailed specifications. Write for your copy today.

THE OLIVER CORPORATION
400 West Madison Street, Chicago 6, Illinois

a complete line of industrial wheel and crawler tractors and matched allied equipment

For more facts, use Request Card at page 18 and circle No. 413

A Bucyrus-Erie crane with 55-foot boom picks up a timber template after driving a four-pile bent. Piles were cast at the job site. A temporary timber work bridge with removable planking was built to permit the crane to pick up a pile and walk it out to the bent locations.

Side ditches provide borrow for roadway through marshland

Excavation is used for fill, eliminating hauls in marshes; bridge built with four precast concrete piles per bent

Using side ditches to obtain over 150,000 cubic yards of borrow, Seaboard Construction Co., Brunswick, Ga., eliminated the need for hauling material through almost impassable marshlands. This method of road construction, previously used in the Southeastern coastal sections, helped build a 3-mile road that runs halfway through the marshes of historic St. Simons Island, near Brunswick.

In order to provide enough bearing for the Bucyrus-Erie crane to excavate the material, the contractor placed a timber mat along the 15 to 20-foot berm between the side ditch and roadway. The Bucyrus-Erie crane, equipped with a $1\frac{1}{2}$-yard perforated dragline bucket on a 55-foot boom, excavated the stratum of muck and side-cast it 180 degrees along the proposed roadway slopes. Once the top layer of muck was removed, the underlying sand was side cast to form the 5-foot-thick roadway fill. Placed directly over the undisturbed muck stratum, the roadway fill consolidated the muck and forced the entrapped water to escape into the side ditches.

In this way, all the material removed from the ditches was used—the top layer of muck for the roadway slopes and the underlying sand for the roadway fill. The side borrow ditches also accelerated the "squashing out" of the muck underlying the roadway. The muck from the 3 to 8-foot-deep side ditches proved a suitable material, when drained, for grassing the roadway slopes.

Some borrow required

A minimum amount of borrow had to be hauled in for the entire marshland section of the new Sea Island Road. The borrow was mainly used along the 1,500-foot-long stretch, where the overlying muck stratum was about 15 feet thick, and for selected material topping for the mixed-in-place paving.

Two Caterpillar DW21 scrapers, push-loaded by a Cat D8 tractor,

DRY IT OUT WITH ROME DISK PLOWING HARROWS!

Heavy rain last night — mud this morning? A few hours cutting and aerating the site or haul road with a crawler tractor and Rome Disk Plowing Harrow can save the day! On the cut a Rome loosens and dries material to full scraper-blade depth, facilitating loading. On the haul road, it fills in ruts, helps dry out the slick surface. The Rome Disk Plowing Harrow can be hitched or unhitched from the tractor drawbar in *seconds*, immediately releasing the tractor for other work.

Rome Disk Plowing Harrows are ideal contractors' machinery for blending in-place materials or soils, for stablizing road shoulders, dam fills or bridge sites. These multi-purpose machines can reduce your equipment investment, cut operating costs, speed up production.

Rome Disk Plowing Harrows can speed up land clearing, too, cutting out brush and springy young trees too flexible for efficient 'dozer work.

Your Rome-Caterpillar Dealer will gladly help you select the machine you need for your project. See him soon!

ROME PLOW COMPANY, Cedartown, Georgia

Rome Disk Plowing Harrows

For more facts, use Request Card at page 18 and circle No. 414

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- Rotary dryer with forced draft
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- Cyclone type dust collector

Send for new 8 page, illustrated brochure

Wylie Asphalt Equipment

WYLIE MANUFACTURING CO., INC.
P. O. Box 7086, Oklahoma City 12, Okla.

For more facts, use Request Card at page 18 and circle No. 415

A Caterpillar DW21 scraper push-loaded by a Cat D8 tractor hauls in the borrow for the muck-free half of the job. A Cat D7 tractor-dozer, background, spreads the fill for the 3-mile roadway that cuts through the Georgia marshes.

hauled in the borrow for the muck-free half of the job. Along this section, the 5-foot roadway fill was obtained from borrow pits and spread by a Caterpillar D7 tractor-dozer.

The completed roadway consists of a 6-inch-thick sand-bituminous base topped with asphalt and a crushed slag surface-treatment course. The two 5-foot-wide shoulders were built with select material and then grassed.

Precast bridge piles

Only one bridge, across Dunbar Creek, was included in the contract. The 254-foot-long bridge has 11 pile bents spaced on 25-foot 4-inch centers. Each bent contains four concrete piles precast by Seaboard in timber forms set up along the bridge approaches. The piles were 55 feet long and 15×15 inches square.

The contractor first drove temporary timber pile bents and then spanned the creek with timber stringers and planking. This permitted the Bucyrus-Erie crane to pick up a pile at the bridge approach and walk it out to the bent being driven. A Vulcan No. 1 hammer, powered by a Littleford steam generator that was mounted on a truck at the bridge approach, drove the piles to the exact depth. A timber template was positioned at the exact bent location after the timber planking was removed. The template, which obtained the correct 8-foot spacing between bent piles, was supported by the two outside temporary timber stringers of the work bridge. Precast concrete slabs spanned the pile bents to complete the bridge.

Personnel

W. E. Goff was the grading superintendent, and Charles Alderman and C. B. Hareld, bridge superintendents, for Seaboard Construction. C. J. Wynn was resident engineer, and Robert Ellis, highway inspector, for the Georgia State Highway Department.

THE END

Gorman-Rupp news

Kenneth H. Cadigan and Gilmore Hiett, sales and advertising executives, have been elected to the board of directors of the Gorman-Rupp Co., Mansfield, Ohio. Cadigan is vice president in charge of sales, and Hiett was recently promoted from manager of advertising and sales promotion to vice president.

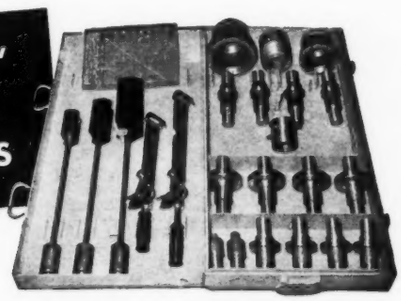
The company also promoted Charles J. Taylor to chief engineer; Robert Regula to manager of irrigation pump sales; Carl F. Frederick to company purchasing agent; Stanley McFarlin to assistant chief engineer; Dale D. McKinley to assistant advertising manager; and Richard E. Flockenzier to auditor.

Robert E. Ehalt has been appointed a district representative for Ohio, West Virginia, Pennsylvania, New York, and parts of Kentucky.

B-K division names two

The Construction Equipment Division, Blaw-Knox Co., Mattoon, Ill., has named K. R. Merrick sales engineer, and William D. Cleeves assistant manager of engineering. Merrick will cover North and South Dakota, Nebraska, Minnesota, Iowa, and part of Wisconsin. Cleeves, formerly an engineer with the firm's Chemical Plants Division, is a registered professional engineer in Pennsylvania. He also holds membership in the American Society of Mechanical Engineers.

"IN-PLACE" SHEAR READINGS



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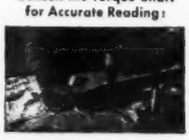

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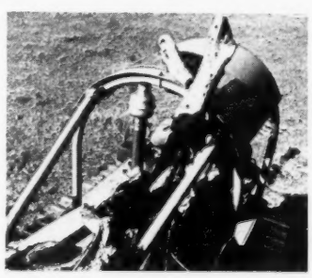

Fleco Heavy-Duty Cab Guard protects operator from limbs and falling trees. Boosts efficiency. Standard Cab Guard also available.

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Your Fleco-Caterpillar Dealer will be glad to recommend the equipment you need for your tractor and for your specific work. He can show you how others with similar needs have cut their costs and stepped up production with Fleco equipment. See him soon!

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DECADE OF MANUFACTURING *1947* FLECO *1957* LAND CLEARING EQUIPMENT

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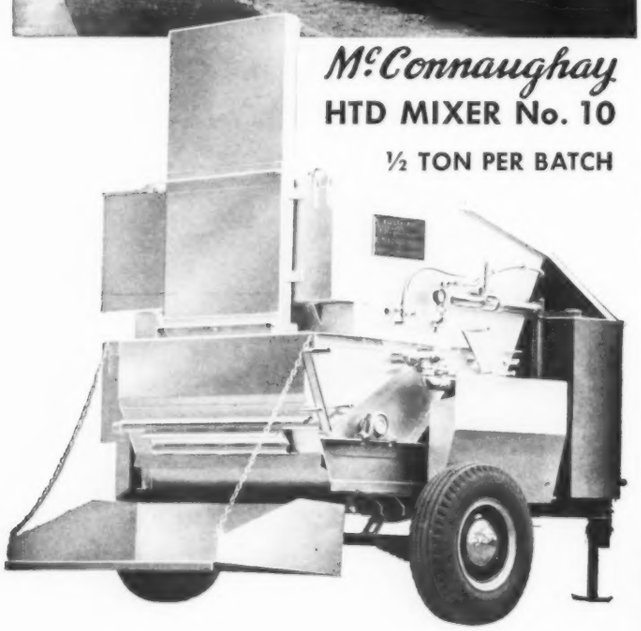
½ TON PER BATCH



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National distributors: Asphalt Equipment Co.
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The lighter side

While the official language of the first world conference on prestressed concrete last month in San Francisco was English, there was plenty of conversation in just about any language you might want to name in the hotel lobbies and on the streets outside. It sometimes gave you the feeling you were in a foreign country when you could not understand the conversation going on around you. Delegates from some 27 countries were present. As for the conference papers, while the accents in which some were given may have been a little heavy, all but two were readily understandable. One of these papers was presented by a Russian, while the other, oddly enough, was given by an Englishman, Professor 'enry 'iggins of "My Fair Lady" is wanted down in Soho Square for another lesson in diction.

• • •

Motorists are honest, at least those who use the Sunshine State Parkway, according to the Florida State Turnpike Authority. Some are loaded, too. A recent patron tendered a $100 bill —the smallest he had—in payment for a short 35-cent ride. The attendant let him through since he couldn't make change, but the next day the now solvent rider returned and paid his toll in silver. For a variety of reasons it has been necessary for many of the toll attendants on the Turnpike to trust some of the patrons who arrive at the toll booths without funds, or with bills too large for the toll attendant to change. Some of the driv-

"Forms in Time", a cast-concrete relief mural, aims to integrate art and architecture through the use of such basic building materials as cement, reinforcing steel, and marble. The piece was commissioned by builder Joseph P. Blitz for the lobby of his newest office building on Madison Avenue in New York City.

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For more facts, use Request Card at page 18 and circle No. 420

Not a flying saucer from outer space, but the largest plastic roof ever built. The panels were assembled to form a 380-foot-diameter circle, before being flown from Manchester, N. H., to Brussels to top the U. S. Pavilion at the 1958 World's Fair in the Belgian capital.

ers mail in the required amount, and many of them make a special trip to the interchange to pay the attendant.

• • •

Building contractor Joseph P. Blitz of New York City chose such basic building materials as cement, reinforcing steel, and marble for artists to use in executing a mural for the lobby of a new office building he is constructing on Madison Avenue. The cast-concrete relief sculpture, "Forms in Time", depicts the integration of art and architecture from the Greek, Roman, and Byzantine periods down to the present day. Two artists collaborated to produce the 11×11-foot cast-masonry sculpture, which is part of the lobby design in the 19-story glass and aluminum structure.

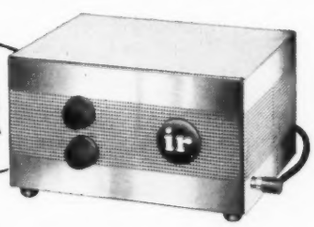
• • •

Another design, this one of a practical nature, is taking shape. This is the largest plastic roof ever built, which will top the United States Pavilion at the 1958 World's Fair in Brussels, Belgium. The circular roof, 380 feet in diameter, will use approximately 2,100 translucent plastic panels manufactured by Kalwall Corp., Manchester, N. H. To provide a general idea of the roof's shape, the panels were laid out on Grenier Air Field, Manchester. Panels range from 4×8-foot to 4×20-foot in size, and are either rectangular or tapered on one side; their thickness is either 1 9/16 or 2¾ inches. To meet the construction deadline, panels are being flown from Manchester to Brussels. The last shipment leaves early this month.

• • •

When the new 41-mile portion of the Erie Section of the New York State Thruway opened August 21, it was operated on a free basis for three hours. The Thruway Authority wanted to give motorists and truckers an opportunity to get acquainted with the newest segment of the cross-State superhighway. From then on everyone pays.

.the VOLUNTEER



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Handles all granular materials — salt, cinders, sand, calcium chloride, rock chips. Spreads at speeds up to 30 M.P.H. Clutch-controlled flow: steady or intermittent for hills and intersections.

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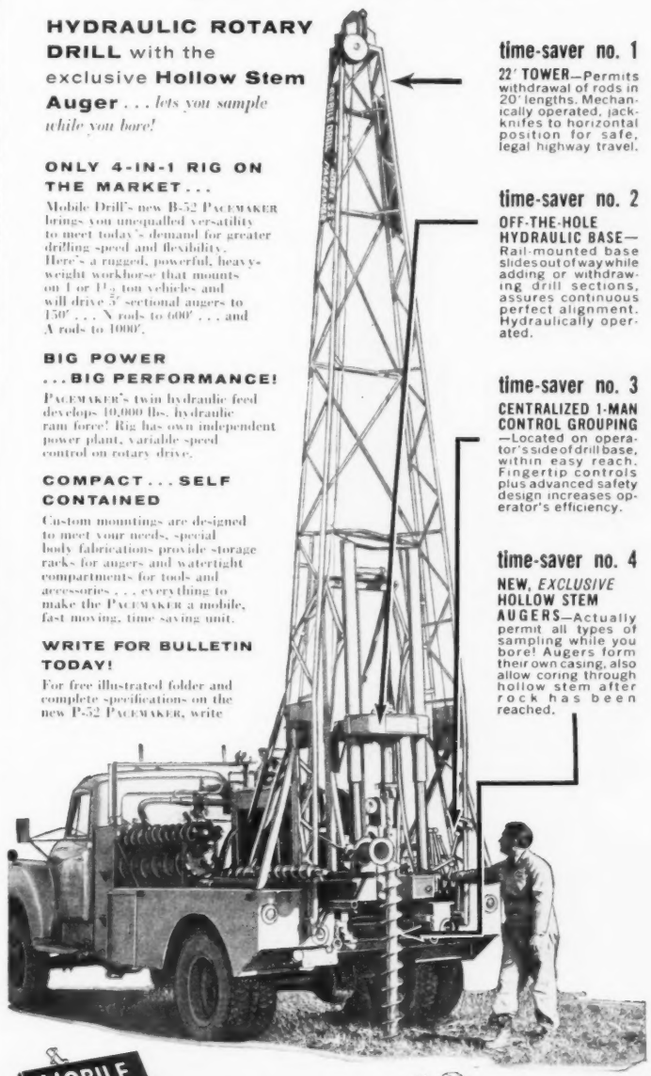

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Surveying washington

by HUBERT KELLEY, JR.

Although badly shaken by a second consecutive defeat, die-hard backers of federal aid for school construction are still on their feet. They are pledging a renewed effort to push through a classroom building measure in 1958, citing as grounds for optimism the slim 5-vote margin by which the House rejected an aid bill this year.

But the negative votes of the past constitute a strong precedent for future action by Congress, and in election-year 1958, the controversial school program will be even more of a disputed issue.

Still more discouraging is the fact that the basic features of the bill voted down this year represented a compromise between what the administration and Democrats wanted. Even with a firm base of support from both sides of the political aisle, the measure failed.

While the House tally against the bill was only 208 to 203, as compared with 224 to 194 in 1956, the maneuver which killed it was the same as that used the year before. The House voted to tag on an amendment barring federal funds to school districts which maintain segregated schools, and then used this as an excuse to reject the bill as a whole. As expected, almost the entire bloc of Southern congressmen lined up against the amended measure.

Democratic advocates of the bill blamed its defeat on what they called President Eisenhower's tepid endorsement of the measure. They claimed it would have gone through had the White House put strong pressure on Republicans to back it.

While it is true that federal aid to schools has been part of the administration's program since 1955, it is also true that the bill on the House floor was a far cry from what the President recommended in January. His proposal called for federal grants of $325 million over a 4-year period only, with the allocations to states being based primarily on their financial needs.

This was pitted against a Democratic plan to spend $600 million annually for six years and distribute the funds on the basis of school-age population only.

The President indicated he was not overly enthused by the compromise legislation that was drafted but said he would go along with it as a "starter" in view of the need for some action. Some congressmen thought this a rather "wishy-washy" stand.

From the stiff resistance the school-financing proposal met at the start, it appeared that any measure would be downed handily. A principal argument used by foes of federal aid was that grants are not necessary; that states and communities are catching up with the classroom shortage through their own efforts.

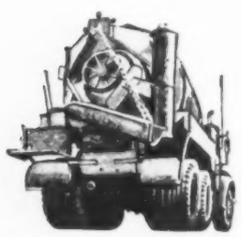
The critics who used this line took their cue from the U. S. Chamber of Commerce, which challenged figures of the U. S. Office of Education that the total classroom shortage now amounts to 159,000 units.

"No critical national shortage in classrooms has been or can be demonstrated to exist," the Chamber said. It added that even if the 159,000 figure is accepted, the total represents but half the deficit existing three years ago and shows that progress is being made without federal subsidies. The Chamber cited a survey by its state units, indicating that at the present construction rate, the "great majority" of states will meet their schoolroom needs within four years.

Vigorous dissent came from Marion B. Folsom, Secretary of Health, Education, and Welfare. Even if states build an expected all-time peak of 69,000 classrooms this year, he said, the national shortage of 159,000 units would be cut only slightly, because 59,000 to 65,000 additional rooms must be constructed yearly to keep pace with enrollment boosts and replacement needs. He said that at this rate it could take 16 to 40 years to wipe out the shortage in school facilities.

Congressmen in the economy bloc acknowledge that passage of the school bill might not unbalance the budget in fiscal 1958, but they express fear that a subsidy program, once adopted, will go on indefinitely. For proof, they point to other so-called "emergency" programs which have somehow acquired the stamp of permanency.

THE END



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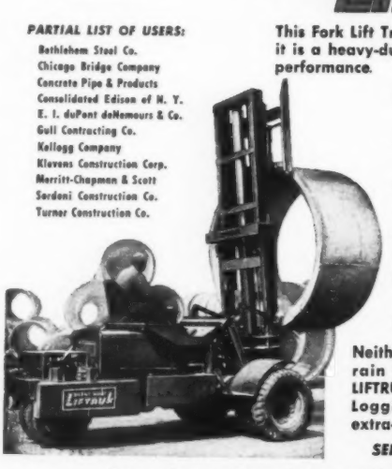

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- **Power Steering.**

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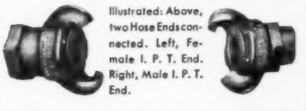

Illustrated: Above, two Hose Ends connected. Left, Female I. P. T. End. Right, Male I. P. T. End.

The "Air King" will reduce operating costs wherever quick connections are required. Locking heads are identical for all sizes of hose or threaded ends within the coupling's size range, and are locked by pressing together and applying a quarter-turn. Equipped with patented Safety Locking Device. Bronze or rustproofed malleable iron, in sizes up to 1".

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DIXON VALVE & COUPLING CO. LTD. TORONTO Associate Company

For more facts, circle No. 426

labor review

Across the country, striking members of the United Cement, Lime & Gypsum Workers went back to work as settlements were reached with individual cement plants.

The stoppages had created a log-jam of unfilled cement orders which tied up construction projects all over the country.

Basic hurdles which the strikers and struck plants had to get over in order to settle their dispute concerned wording of a subcontracting clause on which the union originally was insisting, and retroactivity of the wage increase.

Strike settlements involved some compromises on both sides with regard to these two points. An agreement between the union and Universal Atlas Cement Co., reached in the latter part of July, set the pattern for other strike agreements, calling for no change in the existing subcontracting clause and making most of the wage settlement retroactive.

The package settlement provided total wage increases averaging 13.6 cents an hour, of which 11 cents was a general increase, the remainder going to specific classifications. Of this, 10 cents was retroactive to May 1. Some vacation, overtime, and premium pay improvements also were called for, and the package as a whole was valued at about 16.5 cents an hour.

* * *

The nation's biggest construction strike dragged on in Southern California. An estimated 20,000 workmen were idled in the Los Angeles area while employers hassled with the plumbers, sheet metal workers and hod carriers over new contracts. Over 90 per cent of the city's construction projects reportedly were affected by the walkout.

Key groups in the dispute seemed to be Plumbers District Council 16 and the Plumbing-Heating & Piping Contractors Association of Southern California. Terms of the sheet metal workers' and plasterer tenders' settlements reportedly were contingent upon the contract negotiated by the plumbers.

District Council 16 wanted a 15-cent hike in rates retroactive to July 1; 10 cents more next January 1; new vacation and holiday funds to be financed by employer payments of 5 per cent and 3 per cent; and a boost in health-welfare payments to 5 per cent.

* * *

James T. O'Connell, Acting Secretary of Labor, announced appointment of Robert D. Gidel as chief of the Department's Division of Safety Standards and Services. The post is attached to the Bureau of Labor Standards.

The division, according to the announcement, "provides safety consultation and services for state and federal government agencies, unions, industry, longshore and harbor workers' associations, and foreign governments. It conducts safety training and functions as a clearing-house for safety information. It provides the secretariat for the Federal Safety Council."

* * *

About 5,000 members of the International Brotherhood of Boilermakers & Blacksmiths are covered by a new one-year contract covering construction operations in the 11-state Missouri Basin area. Settlement with various construction companies and associations calls for an hourly pay increase of 20 cents, bringing the rate for all locals but St. Louis to $3.45 (the St. Louis local members receive $3.60).

Increased contributions for health-welfare benefits will go into effect sometime before June 1958 so long as the union is able to negotiate this change elsewhere. The hourly contribution will go up $2\frac{1}{2}$ cents, making a total of 10 cents an hour. Also, the settlement establishes a one-cent hourly contribution designed to finance a "broad scale" apprenticeship program.

Other changes include increase in pay differential for assistant foremen from $12\frac{1}{2}$ cents to 25 cents, for foremen from 25 cents to 50 cents, and for general foremen from 50 cents to 75 cents. The contract expires July 18, 1958.

* * *

The Appeals Court in St. Louis followed through on a theory advanced by the U. S. Supreme Court last year in affirming conviction of a labor leader under the Hobbs Anti-Racketeering Act even though there was no showing that he stood to make any personal gain in the situation. The principle applied was that the use of force or violence in attempting to impose unwanted services on an employer is proscribed by the Hobbs Act.

The union official and his local, Hod Carriers and Laborers' Local No. 397 of Granite City, Illinois, proposed that earthmoving contractors working on a levee repair hire some Local 397 members to work as "swampers" to move in front of bulldozers to warn of approaching pitfalls. The contractor refused and the Local 397 business agent threatened to put the contractor out of business, enlisted a crowd of at least 700 union members to meet at the construction site, and threatened physical harm.

The charge was extortion by attempting to obtain money from contractors "in the form of wages to be paid for imposed, unwanted, superfluous, and fictitious services of laborers" through threats of force and violence, and by fear.

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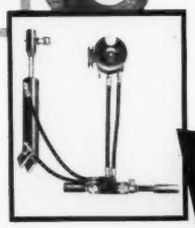

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VERMEER MANUFACTURING CO.

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On a stretch of highway separated from the Mississippi River by a rail line that lies on a lower bench, a Caterpillar DW21 scraper and Cat D9 push-tractor bring the roadway to grade.

As the fill is placed, it is worked over by this Cat D8 with a rock rake. This removes rock unsuitable for the compacted fill, saves rock that can be used as riprap on slopes subject to flood waters.

Extra haul rigs shorten work on highway embankment

Contractor borrows million yards of earth below water level as wellpoint system maintains dry conditions in borrow pit

They say you can't do two things at one time. But Johnson Construction Co., Grove City, Minn., proved this wrong. In excavating a million cubic yards of sand borrow from below water level for the embankment of U. S. 14 and 61 southeast of Winona, Minn., it created a 25-acre lake that is expected to become a popular local recreation spot.

The big borrow pit next to the Mississippi River was dewatered by a wellpoint system and excavated by a variety of excavating and haul units that included scrapers, shovels, dozers, and trucks. Much of the earthwork was done before the end of last season, making it possible for the contractor to complete the grading and remove a surcharge on a swamp fill early this season. The road, together with a continuous section to the northwest, is scheduled for paving this year.

A major part of Johnson's work was building an embankment across two miles of low land, portions of which were wet and swampy. The contractor was given the choice of a hilltop borrow area with a longer haul, and with the haul road crossing a busy area, or a borrow area below water level on the flat beside the highway. The borrow could have been taken from this area by subaqueous dredging, but Johnson decided to gamble on a high-speed dry operation, depending on the dewatering system to hold the water down.

Highway follows river

U. S. 61, the Mississippi River Scenic Highway, hugs the foot of the river bluffs through this portion of the beautiful Hiawatha Valley. The tortuous alignment varies from the flood plain near water level to benches projecting out from the bluffs at different elevations. Sharing the very restricted space between the nearly vertical bluffs and the water's edge are the main-line tracks of the Milwaukee Road's Chicago-Minneapolis line, as well as a series of homes and farms.

Every few miles there is a small town or village nestled on the edge of the valley. Many of these are historic

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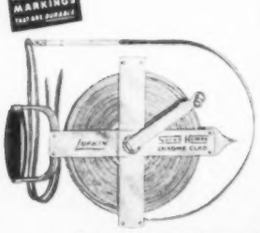

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we have the type and size to best handle the job, dependent on material and equipment

Open-type grab buckets and link-type buckets for bridge cranes, fast-plant unloaders and large gantry cranes are available in capacities from 35 to 400 cubic feet.

Because of their simplicity of design and rugged construction, Brownhoist buckets (such as the link-type left or the open type grab bucket above) withstand extremely severe abuse. Abrasion-resistant alloy steel nose plates protect against coarse materials.

Brownhoist clamshell buckets (right) in capacities from ½ cu. yd. to 3 cu. yds. are used with cranes for handling coal, ore, sludge, slag, rock or wet clay. They're engineered (as a result of over 80 years experience) to take full bites, year after year with trouble-free operation. Write today for catalog.

INDUSTRIAL BROWNHOIST CORPORATION
BAY CITY, MICHIGAN

185-A

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◄ Sand fills are compacted by a Vibro-Plus vibrating compactor powered by a Waukesha diesel engine and pulled by a Cat D4 tractor.

A special pipe boom enables this Michigan Model 175A tractor-shovel to pick up concrete culvert pipe, carry it to a trench, and lay the section without changing hookup. ►

settlements with records dating back to the time when the Mississippi River was the principal traffic artery in the area.

The reconstruction of this highway to modern standards has been a major undertaking not only in construction, but in design and right-of-way, for the Minnesota Department of Highways. The old alignment was too cluttered with buildings to permit widening or revision of the grades to be done economically; most of the modernization had to be on a completely new alignment.

A series of projects, beginning far up the valley to the north, has rebuilt a substantial portion of the 120 miles of highway between St. Paul and Winona. This program has been under way for more than ten years. Construction of the particularly rugged section between Winona and La Crescent began with Johnson's contract.

In this area, the problems are magnified because U. S. 14 joins U. S. 61 at Winona, and the combined route gives rise to a heavy traffic pattern involving a high volume of trucks. This traffic dictated a four-lane divided highway, with the distance from center to center of the roadways ranging from 38 to 75 feet.

Each of the roadways was graded to a 43-foot-wide top with slopes varying according to materials and other conditions. Where slopes might be subjected to river flood waters, they were protected with rock riprap. The top 2 feet of the grade was required to be finished with granular material, and a 3-inch subbase of pit run gravel was placed on the grade.

About half of Johnson's contract section was a sand fill that easily met the requirements for the 2 feet of select material. The other half of the job was in clay and rock, and it was necessary to haul in the 2 feet of sand.

Start big borrow pit

While the clearing crews were still removing trees, brush, and stumps from some parts of the right-of-way, the contractor began operations from the big 22-acre borrow pit which was to yield most of the material for the highway embankment.

A spread of three Caterpillar DW21 scrapers push-loaded by a Caterpillar D9 tractor stripped the 900×1,500-foot pit area and began moving the sand borrow. This spread was immediately joined by a Bucyrus-Erie 54-B dragline, with Bucyrus-Erie 3-yard dragline bucket, and five Euclid 12-yard bottom-dump haul units. These lowered the pit about five feet to water level.

While this initial excavation was in progress, the first stage of a wellpoint system was being installed around the edges of the pit. This first stage reached about a third of the way around the pit on the sides facing the river.

As the pit was lowered, a second stage was placed around the exterior of the pit, and two branch lines were run into the center of the pit. A maximum of about 700 wellpoints in the system at one time were pumped by six 12-inch pumps powered by

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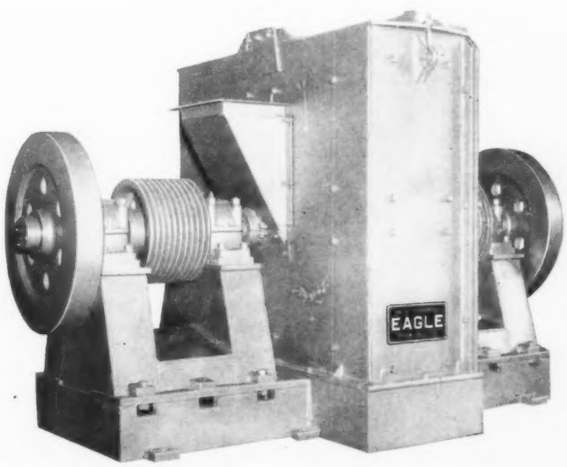

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Working a small pit beside the roadway for 3-inch subbase material, a Bucyrus-Erie dragline stockpiles the material while the Cat D8, pulling a LeTourneau-Westinghouse scraper, gets ready to pick up a load.

tractor retrieved the wellpoints as pumping stopped and the water began to rise. As the hole filled, it formed a clear, sandy-bottom lake suitable for stocking with game fish. The contractor's final operation involved giving the banks a gradual slope to eliminate the danger of a steep dropoff around the edges. The new lake is expected to be a popular local recreation spot.

The sand fill compacted well under the action of vibrating rollers. Three Essick vibrating compactors and a Vibro-Plus Terrapac worked the embankments continuously, compacting the material as it was placed. The rollers were pulled by Caterpillar D4 and Allis-Chalmers HD-5 tractors. As the embankment was brought to grade, it was finished by three Caterpillar D8 tractors with LeTourneau-Westinghouse FP scrapers and two Caterpillar No. 12 motor graders.

One section of the embankment was built across about 4,000 feet of wet swamp close to the river. A surcharge of from 3 to 12 feet was built up above the finished grade to speed any possible subgrade settlement and insure

(Continued from preceding page)

GM 4-71 diesel engines. Individual 2-inch points were 30 inches long, making the complete riser 24 feet over-all. They were attached to 10 and 12-inch headers at 3 to 10-foot centers. The second-stage points reached approximately eight feet below the bottom of the excavation. A third stage of 16-foot points was installed in a portion of the pit.

The dewatering problem here was particularly difficult, because of the closeness of the river and the sandy material that lay between the river and the pit. In order to use scrapers, draglines, and dozers to excavate the borrow, the contractor had to keep the dewatering system from cluttering up the borrow pit. This meant that there could be few branch lines, and that the water had to be drawn down deep enough to keep the pit dry in the wide spaces between the lines.

The pumps were started about two weeks before the excavation got down to water level, and they continued pumping for $2\frac{1}{2}$ months. In one two-week period, the pumps removed water at rates of about 16,000 gpm. The water level was lowered enough to permit dry excavation to a depth of 22 feet below the water table.

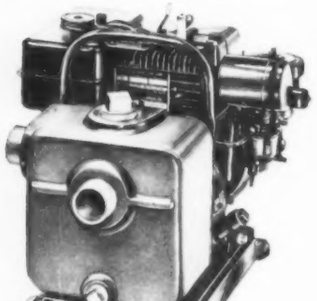
Rush excavation

Since it cost plenty of money to hold the water level down, Johnson proceeded to move a lot of the borrow in a short time. Four more Caterpillar DW21 scrapers and two more D9 tractors were added to the scraper fleet as the excavation went down into the dewatered area.

When this still seemed too slow, a 48-inch belt loader was moved into the pit. Caterpillar D8 and D9 tractor-dozers pushed the sand to a trap feeding the 50-foot-long belt, which was driven by a GM 2-71 engine. Then, after six trucks had been added to the fleet of haul units, the trucks, scrapers, and "Euc" bottom-dumps made a continuous stream of rigs hauling from the belt. In one 60-day period, this spread moved approximately a million cubic yards of borrow.

When the embankment had been completed, the borrow pit was a 22-acre hole averaging 22 feet deep. Starting from the bottom, the con-

YEARS AHEAD



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Simplicity of design, **with no troublesome check-valve,** assures years of dependable operation.

Midland portable pumps are of aluminum construction, including the engine. The 1½" pump weighs only 47 pounds, and the 2", only 50 pounds, with capacities of 5,000 and 7,000 gallons per hour.

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Put Barco Rammers on the job and watch the results. One of the biggest advantages they offer is ability to handle work in minimum time.

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518K Hough St.
Barrington, Illinois

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Included in the grading project is this drainage channel leading to the Mississippi River.

stability of the embankment. This surcharge consisted of select granular material, suitable for the top 2-foot lift of the subgrade, which was left in place all winter. When it was removed this spring, it was hauled to the far end of the job to build up the granular subgrade lift.

Base course

A small second pit was opened beside the roadway to produce the pit-run material for the 3-inch subbase lift. The three D8's with FP scrapers excavated this material from 1 foot to 5 feet below natural ground. The excavation was stockpiled, and later it was deposited on the roadway by trucks.

Near the east end of the job, where the grade changed from fill to cut, the Caterpillar DW21 scrapers and D9 push-tractors moved most of the material. Much of this was clay soil containing a high percentage of rocks, but there was also a small amount of rock excavation. Most of this area was loosened or ripped ahead of the scrapers by a LeTourneau-Westinghouse ripper pulled by a Cat D8. Some of the larger boulders and some of the solid rock had to be drilled and blasted.

Since a considerable volume of rock was required for riprap, a Caterpillar D8 tractor with a Fleco rock rake worked the ripped cut areas and the fills, removing as many rocks as possible. These were pushed up into piles and later loaded into trucks by a Michigan 175A tractor-shovel. The clay fills in this section were thoroughly compacted by tractor-drawn Bros and LeTourneau-Westinghouse sheepsfoot rollers.

Among the important incidental items included in Johnson's contract were the furnishing and installation of 3,000 linear feet of concrete and corrugated metal pipe drainage structures ranging from 18 to 48 inches in diameter. The Michigan 175A tractor-shovel was fitted with a special pipe-handling boom that worked exceptionally well for the relatively heavy concrete pipe.

Without making an intermediate stop or changing hookup, the Michigan picked up a section of pipe from a stockpile, carried it across the field or the sandy fill to the pipe trench, and lowered it into place. The pipe boom gave the tractor-shovel enough vertical reach to carry the pipe well above the ground, and permitted the rig to reach down five feet or more to place the pipe in the bottom of the trench.

Other drainage work included the placing of 1,300 cubic yards of concrete in box culverts and erosion control structures, and the construction of 236 linear feet of 123-inch structural-plate arch culvert. More than 1,000 linear feet of sanitary sewer pipe was also laid.

Johnson Construction Co., sometimes known as Johnson Brothers Construction Co., is owned and operated by five brothers. One of the brothers, Ray Johnson, was the full-time superintendent of this job. On his staff were J. Bjork, Don Nesseth, and Clair Carlson, grade foremen; Joe McKinnon, clearing foreman; and John M. Wordelman, field office manager. Supervising the dewatering operation was O. H. Weinkauf.

The project engineer on the work for the Minnesota Department of Highways was O. J. Gerner. The work was supervised by the Rochester District, which has Clayton A. Swanson as district engineer. L. P. Zimmerman is chief engineer and commissioner of Highways. Other state personnel on the job were R. Ahlstad, chief of party, and D. Lageson, grading inspector. THE END

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With FORMULA No. 640

A clear liquid which penetrates 1" or more into concrete, brick, stucco, etc., seals—hold 1250 lbs. per sq. ft. hydrostatic pressure. Cuts costs. Applied quickly—no mixing—no cleanup—no furring—no membranes. Write for technical data—free sample. HAYNES PRODUCTS CO., OMAHA 3, NEBR.

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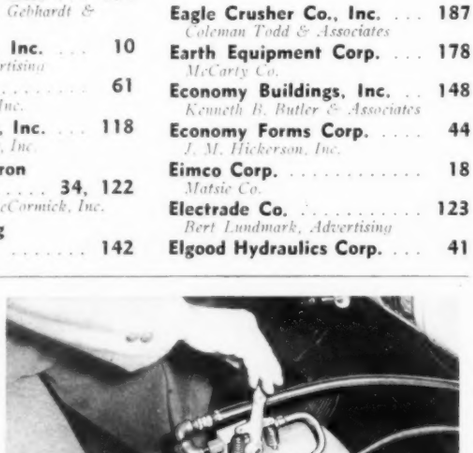

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Publisher's Postscript

This month's column is being written en route east by air from San Francisco, where Ralph Monson, field editor for the western states, and Al Miller, Pacific Coast business manager, and I attended the World Conference on Prestressed Concrete Construction.

For a comprehensive report on this meeting from an engineer's point of view, see Ralph's article on page 29. I wisely passed up the technical sessions in favor of the 38 exhibits staged by manufacturers and suppliers. All seemed to agree that the number of delegates present (about 1,500) and the degree of interest shown were beyond expectations. Much credit goes to the University of California for sponsoring the meeting, and to the Prestressed Concrete Institute, which is rapidly becoming a trade organization of considerable stature.

Several months ago, when we first learned of the World Conference, CONTRACTORS AND ENGINEERS editors set aside our September issue for a representative group of staff-written field articles that would mirror current job practices and techniques in prestressed work. This project almost ran away with us as field editors sent in one article after another, complete with photos, on some of the latest prestressing jobs. The eight articles selected, and the many advertisements on prestressed concrete products, make this September number a good reference and where-to-purchase guide that contractors and producers may want to keep. So important is this issue that we have increased the print order in anticipation of a demand for extra copies.

One last comment in a personal vein. In 20 years of convention, conference, and meeting attendance, I never saw delegates as dedicated to their work. One cab driver was heard to lament: "Don't these fellows relax and get out on the town even by 9 p.m.?" Few did. The great majority spent their evenings looking at films on prestressing.

In addition to the wide range of field articles and usual features, the October issue of CONTRACTORS AND ENGINEERS will have several articles and some timely advertising on winter construction practices. Cold-weather construction operations seem to be on the increase each year. As our contribution to better and lower-cost job performance in winter, our October issue will show successful field expedients and techniques that can increase output or decrease downtime on off-season jobs. It should be of special interest to contractors who must battle Old Man Winter to complete a current project; to those who are thinking of doing some work this winter; or those who want to know how others are faring with winter work.

Don Buttenheim

PUBLISHER

ROCK AND DIRT MOVE AS GREENVILLE ATECO RIPPER GOES TO WORK ON BLUE RIDGE PARKWAY

BIG BITE TAKES FULL POWER OF TD-24 TRACTOR

The big Greenville tractor-mounted ripper proved itself on a rough testing ground originally marked for blasting, and shovel and truck loading. Biting to depths of 24 inches, the powerful unit tore out layers of rock and dirt without explosives. Swivel shanks give the points live action that shatters rock and dirt loose for scraper loading.

Roy Cantrew, veteran construction man who operated the unit, used it to rip, bulldoze and push-load. He found it possible to raise or lower the ripper points as little as an inch at a time . . . a control factor that marks the precision construction put into the new tool.

PUSH-LOADING SCRAPER

The new Greenville ripper does not interfere with push-loading operations or steering of the tractor. On this job all loading was planned to be a truck-shovel operation. The powerful bite of the ripper made

push-loading possible—a big saving in man-hours and equipment operation.

AND BULLDOZE, TOO

Addition of the ripper does not hamper bulldozing operations. Blade and ripper are in place at all times. Many operators rip one way, turn around, then bulldoze their way back. One man with one machine can handle jobs previously done by three or more pieces of equipment.

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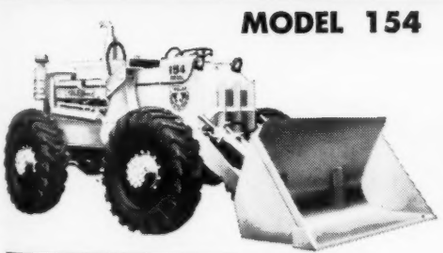

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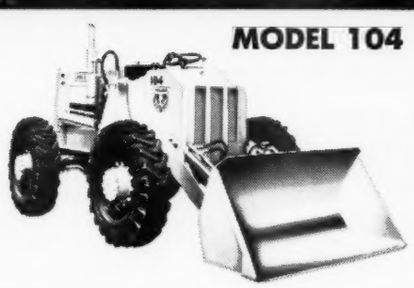

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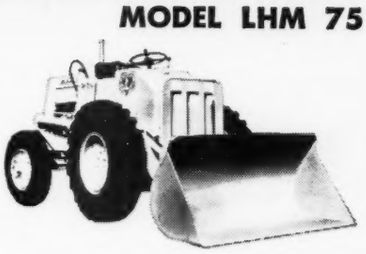

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Job: *remove 1,000,000 cobblestones plus 30,000 square feet of concrete*

Loading costs threaten profits until N.Y. firm buys this 2¾ yd Michigan

Due to extremely rigid job specifications and unusually tough material, Triboro Asphalt Company, Flushing, New York, faced a substantial loading problem in stripping 31 blocks of six-lane Third Avenue in Manhattan. Recognizing the advantages of a single machine with speed and power to keep costs from getting out of hand, they asked NYC distributor United Tractor & Equipment Corp to demonstrate a 2¾ yd Michigan Tractor Shovel. When they saw, they bought!

Replaces big crawler

The 24 mph Michigan replaced a 3 yard crawler loader. "The crawler was too slow . . . too often blocked traffic . . . and it couldn't get big enough loads to maintain the desired production pace," according to Supt James Magnotta. Smaller crawlers, attempting to load heavy granite-slab cobblestones, tore out final drives and ended up in the shop. Two big rubber-tire loaders, which had a crack at the job, were sent back to the yard. "They didn't have either the power or the traction needed," said Supt Magnotta.

Does job in 27 days

So the Michigan, working alone, piled and truck-loaded *all the cobblestones.* Over a million of them were handled, according to engineers. Each measured about 8 x 12 inches, weighed about 15 lbs. Individual bucket loads averaged 250 blocks each . . . 3,750 lbs. *The entire job was done in 27 eight-hour days* . . . far faster than other stripping contractors doing the same kind of work with power shovels and crawler-loaders elsewhere along Third Avenue. "Far better too," adds Magnotta. "Our Michigan left the sub-base clean after only one pass. Sensitive controls let the operator keep just enough down-pressure on the bucket. All we had to do before laying asphalt was level a few spots."

Breaks out concrete

After several days, the Michigan operator became so enthusiastic about the power of his machine, the street foreman tried to tame him down. He gave orders to break out and load some concrete pipe-vault roofs. Even this tough problem had a simple solution. By working bucket edge under the vault and using Michigan's terrific breakout, operator easily broke it loose. Concrete patches and driveway extension, some 15 to 50 square feet, proved just as easy. "I put in some terrific days—running around the job like a pickup truck," says the operator, Fred Cerbone. "Did a great amount of work yet was *less tired* at the end of a day than on anything else I've operated in my *25 years* with Triboro."

How to cut costs

Triboro's Michigan did more than boost operator satisfaction. It helped cut many dollars of expense from the multi-thousand dollar paving project! As every contractor knows, bidding is extremely competitive on this kind of job; by handling loading and clean-up efficiently, the Michigan kept these expense items from eating profits.

With Clark torque converter, power-shift transmission, power steer, and planetary-wheel axles standard on all models, Michigans deliver more usable power, traction, and speed than any other machines of their type. If you're willing to be convinced Michigan is in a class by itself, do what Triboro did: *ask for a demonstration.* You name the job!

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